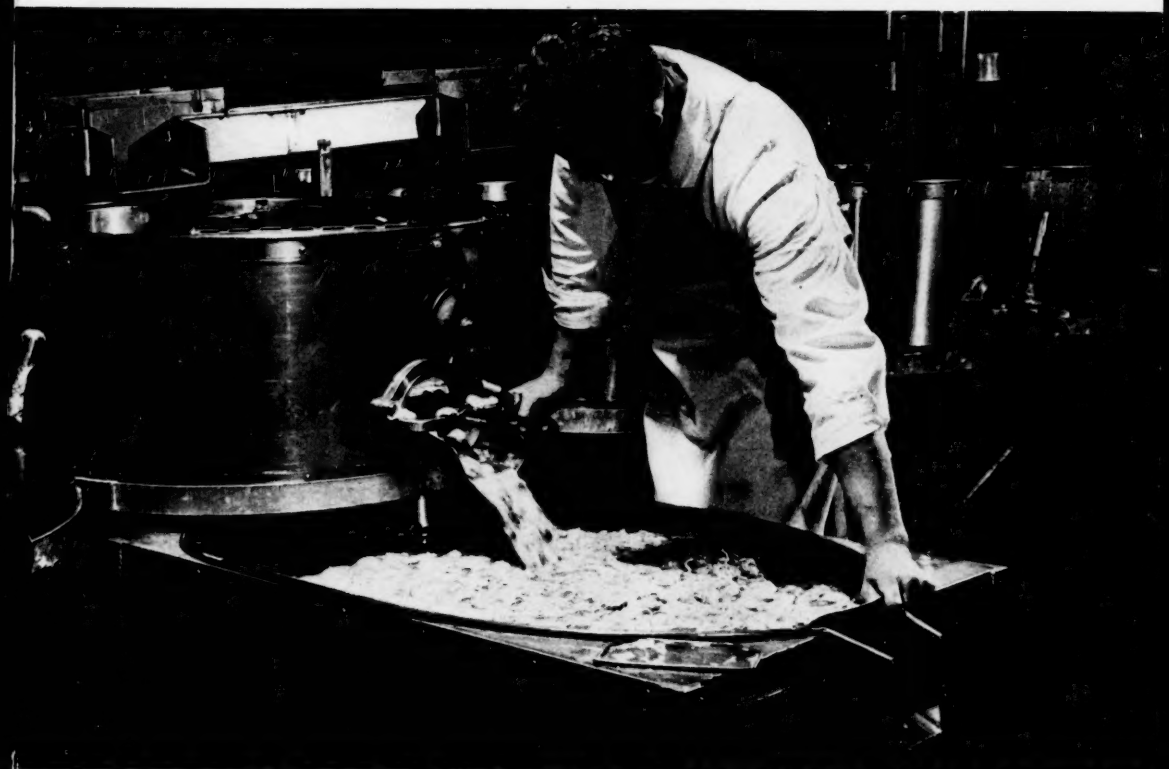
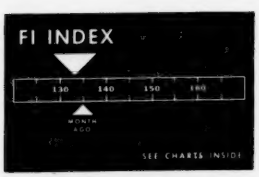
PACIFIC EDITION

Food Industries

For those who control quality and costs through management and production—a McGraw-Hill publication



Shucked oysters are gently washed in stainless steel tanks by air-agitated city water at Bluepoints Co., Greenport, N. Y.



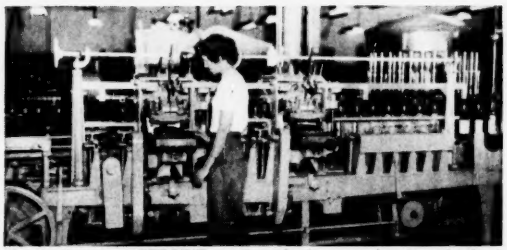
MARCH, 1949: Durkee efficiency, "Diced Cream," Detergent guide, Enrichment, Gasometry, Coding, New canning technic, Report, Flowsheet

WORLD *Labeler* NEWS

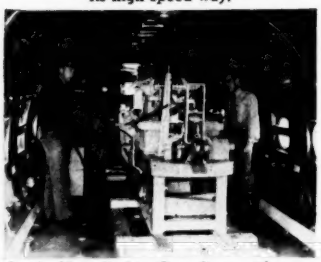
United Air Lines
Another World BEE-LINE Labeler / being Shipped Via: UNITED AIR LINES AIR FREIGHT
To: PETRI WINE CO.
AT STOCKTON, CALIFORNIA
"SPEEDING PETRI TO YOU"

Petri of California wanted the best Labeler in the WORLD, and wanted it *quick* — so-o-o, here is a World Model 120 BEE-LINE Labeler via air freight — the largest single piece ever flown from Boston.

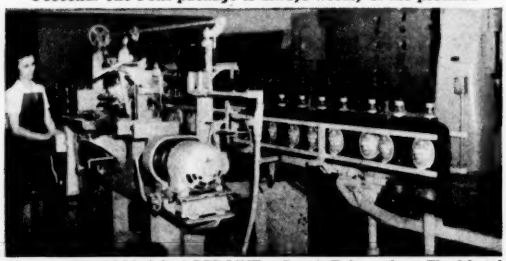
BEE-LINE gets ready to fly on a bee-line to California — a high production Labeler on its high speed way.



Here's that same BEE-LINE on the job the very day it arrived, at Petri's Escalon plant. Labels are neatly, firmly, precisely applied two-a-second. The Petri package is always worthy of the product.



Inside United's big Cargoliner with room to spare!



Here is a World Model 40 BEE-LINE at Petri's Tulare plant. The Model 40 is the BEE-LINE for gallon and half-gallon jugs or bottles.

After its cross-continent flight, the World BEE-LINE disembarks at Stockton, Cal.

NEW BULLETIN contains complete information, specifications and floor plans of all BEE-LINE Labelers. May we mail you a copy?

ECONOMIC MACHINERY COMPANY

Builders of World Automatic and Semi-Automatic Labelers for Every Purpose

WORCESTER, MASSACHUSETTS

New York Philadelphia Pittsburgh Chicago San Francisco Los Angeles Denver Louisville Salt Lake City El Paso Seattle Portland Phoenix London Montreal Toronto Winnipeg Newfoundland Vancouver Mexico City Sydney, Australia Wellington, N.Z. San Juan, P.R. Ciudad Trujillo, D.R. Honolulu, T.H.

Western Food Industries

SECTION OF FOOD INDUSTRIES
Trends, Events, Developments

C. R. HAVIGHORST
Pacific Coast Editor, San Francisco

ELSIE SCHMALZ
Assistant Pacific Coast Editor

MARCH, 1949 • PACIFIC COAST EDITION FOOD INDUSTRIES • VOL. 21, NO. 3

Say Columbia Fish Ladders Harm Salmon; Up-River Control Dams Recommended

McNary Dam fish ladders will be the biggest on the Columbia River—but fisheries men doubt they will do much good.

Two or three of the fishways will be built to get the salmon past the 90-ft. barrier of McNary Dam and on their way to spawning grounds. But fisheries men say that at Bonneville Dam, 25 ft. lower, there has been a definite loss, both in adult fish bound upstream and in fingerlings bound downstream.

Fisheries people further point out that salmon do not eat on the journey upriver and have just about enough energy to reach their spawning grounds. Struggling up ladders uses so much energy they do not have enough strength left to complete the trip.

Thomas F. Sandoz, of Columbia River Packers Assn., Inc., says the fishing industry is as anxious as any other industry to see development of the Columbia for power and irrigation, yet such development could be attained through control of streams in the upper tributaries of the river by construction of a series of flood control and power dams.

A similar opinion was unofficially expressed by Dr. Fred Fish, U. S. aquatic biologist stationed at Oregon State College to study this and related subjects. He holds that construction of the Willamette River system of dams will prove more beneficial than detrimental to fish life if present plans are carried out.

Dam Benefits

Citing the case of Shasta dam on the Sacramento river, Dr. Fish observed that a dam, under certain conditions, can increase rather than decrease favorable spawning areas. A dam can reduce overflow, which every year traps millions of salmon fingerlings away from the river; it can increase low water flow, thus reducing late summer pollution by dilution; and it can release cooled stored water into summer waters, too warm for fish to spawn.

Improvement of the Willamette watershed to serve these purposes is seen as necessary by Dr. Fish in order to compensate for the decrease of fish life sure to occur on most other tributaries of the Columbia. The series of high power dams elsewhere is bound to diminish seriously the salmon supply from headwaters—not because spawning fish cannot get above them but because the violent pressure changes at the dams kill the fingerlings going back to the sea.

Idaho Waste Potatoes Converted To Profitable Starch and Feed

Cull potatoes, formerly Idaho's biggest waste item, have returned $2,300,000 to farmers and $6,300,000 to processors since the state's first two starch manufacturing plants went into operation in 1941, says R. E. Gale of the Idaho Power Co., Boise. Gale notes that 470,000 tons of culls have been turned into starch and stock feed since the idea was first suggested by the National Farm Chemurgic Council.

Idaho potato production during the past eight years averaged about 38,000,000 bu., exceeded only by output of the state of Maine. Since only top grade potatoes are shipped, culls sometimes exceeded 300,000,000 lb. yearly. Now that former waste is being used.

The starch producing plants are located at St. Anthony, Menan, Twin Falls, Blackfoot and Jerome. Some are equipped to convert the starch into glucose. These plants have a minimum capacity of 20 tons of starch daily and require from 160 to 300 tons of potatoes per day. They are located in areas where more than 250,000 tons of commercial grade potatoes are produced within a radius of 30 miles from the plant location, thus insuring an adequate supply of cull potatoes in a minimum production year.

The high-quality starch produced has many uses; the largest being in the textile trade, where it commands a premium price for its desirability in the manufacture of fine cotton, rayon and other fabrics. Much is also used in the making of food products, as well as pharmaceuticals, paper and adhesives.

Shippers See Hopeful Signs In Freight Rate Plight

A gleam of hope is now seen by shippers in the freight rate situation. For even the president of the Union Pacific Railroad, George F. Ashby, has observed that the railroads will have to stop requesting further freight rate increases lest they price themselves out of business.

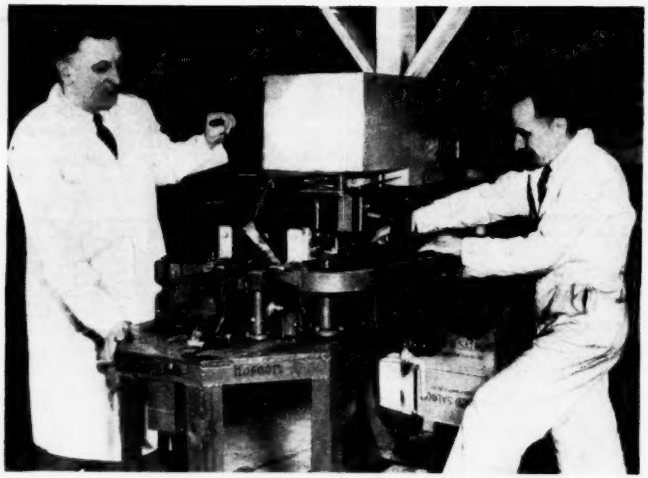
Moreover, the Interstate Commerce Commission has told Congress that "rate increases may be carried to the point where they are largely self-defeating."

Rail freight rates rose 44 percent between June 30, 1946, and last November, says ICC. Since then, they've gone up an average of 5.2 percent on a temporary basis, pending the Commission's decision on a plea for a 13 percent rate boost.

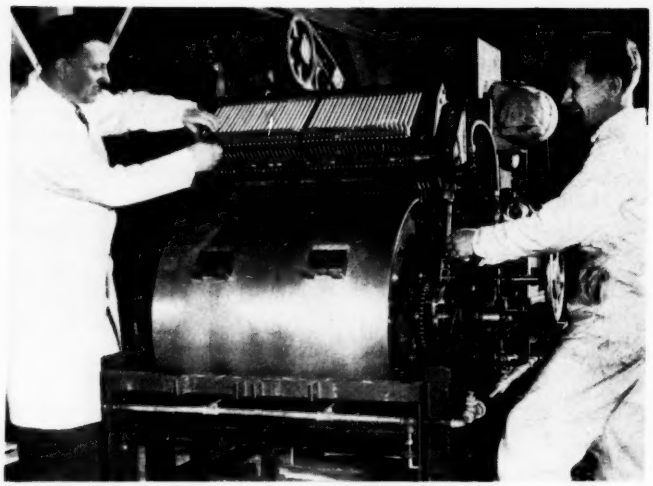
Meanwhile, a slap on the other cheek for western brewing interests was the ICC reduction of rates on beer and malt liquors shipped from midwestern and eastern producing points to the Pacific Coast and on the empty containers returning to those points. Western brewers have petitioned the Commission to suspend the reduced rates, charging eastern discrimination.

New Uses for Filberts

Research at Oregon State College to develop new food products from filberts, has resulted in a filbert butter that is pronounced an excellent spread and sandwich filler. The nut contains about 25 percent protein, in addition to its fat content, and also valuable vitamins and minerals. Other new food uses are being sought. Samples of filbert flour have been produced and used successfully for baking purposes.



Large backbones of salmon are removed by this machine . . .



. . . then fish halves are skinned in this unit

Machines Process Boneless, Skinless Salmon

At Pacific American Fisheries, two special machines are now being employed to prepare salmon for the company's boneless, skinless pack.

After initially passing through the "iron chink," which removes heads, tails and guts, the fish go to the first unit, which removes the backbones. Then the resulting salmon halves are skinned in the second unit.

Operations of the two machines can be indicated through reference to the accompanying illustrations. Upper photo: Fish is first placed, backbone up, on metal bar at front of machine (foreground), then it travels into a vertical, circular knife (pointed to by man at right), and is cut into two pieces, which fall to either side.

This cut is made just to one side of the backbone, and the backbone portion then goes into a curved, open tube, on the opposite side of the knife, and is disposed of below.

Lower photo: Going to second machine, fish halves are placed vertically (head end down) in slots (visible in drum), then circular motion of drum pulls them into skinning knife. Erwin Hube (left), of PAF's research department, indicates the spring-held metal fingers which grip the salmon halves as they are carried to the razor-sharp moving knife that cuts between flesh and skin to leave the clear meat for packing.

Ice-Less Fruit Shipping Next?

Modified-atmosphere cars, instead of refrigerator cars, may be the next step in preserving fresh fruit during shipment to eastern markets.

Experiments by University of California pomologists indicate that fruit held at 60 to 85 deg. F. in air modified by either oxygen reduction or carbon dioxide addition will keep as well as fruit held at refrigerator car temperatures of 40 to 45 deg. F. in normal air. However, no actual shipping tests have yet been undertaken.

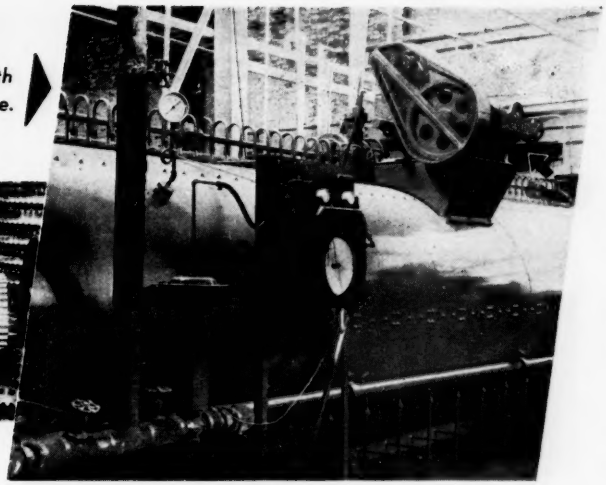
Satisfactory effects were obtained experimentally either by reducing oxygen content from the normal 21 percent to 5 percent or less, or by adding 10 to 25 percent carbon dioxide. These methods show varying reactions on different fruits. Both methods were successful with plums and pears. Peaches fared better with low oxygen, grapes with added CO_2.

Good Score by New Chicken

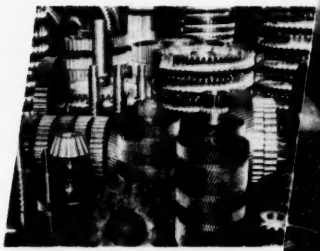
A new leghorn strain with excellent production and survival characteristics has been developed by the Washington Co-operative Chick Assn., Bellingham. Tests show an average lay of 250 eggs a year, while laying-house mortality is only 8.9 percent.

Some 15,000 of the new birds, known as the F x C cross, are in actual production on members' farms. Profits of up to $2 per bird are expected in 1949. The eggs are pure white and weigh an average of 25.8 oz. per dozen.

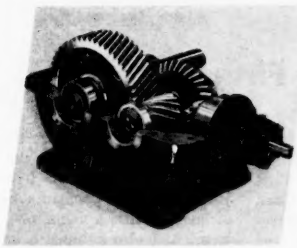
FOOD INDUSTRIES is published monthly by McGraw-Hill Publishing Co., Inc. James H. McGraw (1860-1948), Founder; James H. McGraw, Jr., President; Curtis W. McGraw, Vice-President and Treasurer; Eugene Duffield, Executive Assistant for Publications; Nelson Bond, Director of Advertising, Joseph A. Gerardi, Secretary. PRICE: 35c per copy. Subscription rates: U.S. and possessions, $3 for 1 yr., $4 for 2 yrs., $5 for 3 yrs. Canada, $4 for 1 yr., $6 for 2 yrs., $8 for 3 yrs. (payable in Canadian or U.S. funds). Pan American Countries, $5 for 1 yr., $8 for 2 yrs., $10 for 3 yrs. All other countries, $15 for 1 yr., $25 for 2 yrs., $30 for 3 yrs. Indicate position and company on subscription orders. Subscriptions invited only from food processing executives, engineers, technologists, operating supervisors, consultants and laboratories. EDITORIAL AND EXECUTIVE OFFICES: 330 West 42nd St., New York 18, N. Y. Cable address: "McGraw-Hill, N. Y." Address correspondence regarding subscriptions to J. E. Blackburn, Jr., Director of Circulation. PUBLICATION OFFICE: 99-120 N. Broadway, Albany 1, N. Y. Entered as second class matter Aug. 26, 1948, at Albany post office under Act of Mar. 3, 1879. Return postage guaranteed. Member A.B.P. and A.B.C. Indexed monthly in Industrial Arts Index. Copyright 1949, by McGraw-Hill Publishing Co., Inc. All rights reserved.



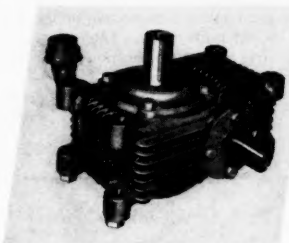
Large pressure cooker with Reeves variable-speed drive.



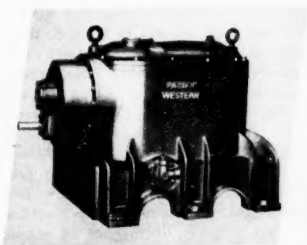
Gears of all types and sizes



Single-reduction speed reducer



Cone gear unit



Vertical-shaft speed reducer

SAFEGUARD YOUR INVESTMENT

against costly failures with PACIFIC-WESTERN Equipment

Failure of mechanical power-transmission equipment used in food processing causes a double loss—spoiled food and plant shutdown while repairs are being made. Safeguard yourself against such failure by specifying "Pacific-Western" when replacing worn-out equipment or when adding to your facilities. The complete Pacific-Western line consists of Reeves variable-speed units; Pacific, General-Electric motorized, speed reducers; couplings; Cone gears and reducers; and the popular Pacific-Western line of speed reducers and high-speed units.

GEARS FOR EVERY JOB . . . tailormade to your requirements to insure maximum life efficiency are part of Pacific-Western service to food industries. We design and cut all types and sizes of gears and build special gear boxes. Let us help solve your mechanical power-transmission problems, quickly, efficiently, and economically.

Fast Delivery on Many Popular Types and Sizes of Speed Reducers from Stock. Let Us Quote Your Needs.

Write, wire or phone your nearest Pacific-Western plant or office for complete information.

WESTERN GEAR WORKS, Seattle 4, Washington
WESTERN GEAR WORKS, Box 192, Lynwood, California
PACIFIC GEAR & TOOL WORKS, San Francisco 3, California
SALES REPRESENTATIVES: Portland . . . Salt Lake City

AGMA MEMBER

GOOD GEARS FOR OVER 50 YEARS

PACIFIC GEAR & TOOL WORKS ⚙ WESTERN GEAR WORKS

PACIFIC-WESTERN

4827

GEAR PRODUCTS

Waffles baked . . .

. . . frozen . . .

. . . and packaged

Frozen Waffles Offered by Spokane Firm

JAY J. KALEZ

Correspondent,
"Western Food Industries"
Spokane, Wash.

A crisp, brown, "frozen-cooked" waffle that can be defrosted and heated in any automatic toaster is the new product of The Chef Frozen Food Co. of Spokane, Wash.

Two World War II veterans, J. P. Gahard and Albert Ferrara, with food know-how gained from experience with TWA and Northwest Airlines operate this new plant. Using a "secret" recipe of "aged-cake dough", the batter is prepared and ladled onto the irons by hand. Cooking temperature of 400 deg. F. is maintained by thermostatic control.

When baked, the waffles are placed on cloth-covered grills, which are then set in large aluminum trays. The cloth absorbs any steam or condensate resulting during cooling. After the waffles are cooled, they are moved into a freezer. It requires about 1 hr. to freeze to a temperature of —5 deg. F.

After freezing, the products are packaged, two each in a cellulose wrap. Twenty-four packages make a carton.

When the plant was started last year, the idea of producing waffles in volume was so new that food machinery manufacturers had no equipment to do the job automatically. Adaptations of domestic waffle irons (see photo) were made to start the operations rolling. However, the company has now been promised delivery of an automatic waffle pouring machine coordinated with a bank of 20 baking irons, and also automatic waffle wrapping machines.

Present capacity of the plant is 2,000 waffle packages per day. With the installation of the new equipment, production is expected to be at least 5,000 units daily. Currently, the entire output is contracted for by the Pacific Greyhound Bus Lines.

The company plans production of other frozen foods, such as chicken and steak pot pies.

Weed Men Meet

The California Weed Conference was held this year February 16-17 in Sacramento, under the joint auspices of the State Department of Agriculture and the University of California College of Agriculture. Open to the public, the conference covered research developments, regulations, farmer educational programs, and machinery and materials for weed control.

Asiatic Fruits For the West

Over 900 samples of fruit and nut varieties, unknown to California horticulture, have been imported from the Middle East for possible introduction here. Seeds and cuttings were obtained by Dr. Harold P. Olmo, associate professor of viticulture at the University of California. Dr. Olmo used his sabbatical leave and a Guggenheim fellowship to travel 6,200 miles through Pakistan, Afghanistan and Iran, areas believed to be the original home of such fruits as the plum, grape, cherry, and pomegranate, also of the almond.

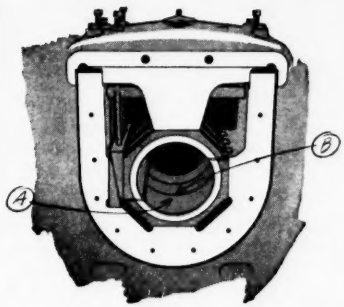
Investigates Wine Quality

A survey of yeasts and bacteria found in wines submitted to judges of the 1947 and 1948 California state fairs has been undertaken by University of California to ascertain whether the microbiological content is a contributing factor in the quality of bottled wines.

Paul E. Alexander Passes

The death of Paul E. Alexander at Los Angeles on January 25, 1949, was a deep and personal shock to his many friends. Born in Missouri, Dec. 12, 1901, Mr. Alexander attended grammar and high schools in Omaha, then received his B.S. degree from the University of Nebraska. He joined American Can Co. in 1926, coming to the Pacific Coast in 1930. In March 1942 he was made assistant manager of research in San Francisco. Then in August 1945 he was sent to Los Angeles as research representative for the company in that area, a position he held until his death. As an active member and past official of the Institute of Food Technologists, he was well known in western food fields.

Case 1145—Cutting Lube Cost in General Equipment



AIR COMPRESSOR MAIN BEARING

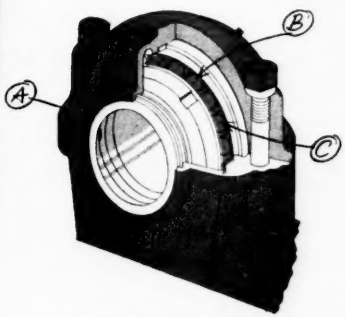
Calol Multi-Service Oils in air compressors decreased lubricant consumption as much as 20%. Highly efficient in many machines, including Diesel engines, pumps, enclosed reduction gears and their integral bearings. Come in six grades: 45X, 50X, 55X, 65X, 75X, 85X. Approximately SAE 10 to SAE 50.

A. Contain oxidation-resistant compounds ... prevent formation of varnish and lacquer on bearing surfaces, engine cylinders, pistons, etc.

B. Special compound assures lubrication at high temperatures — has inherent tendency to "run toward" hot surfaces ... spreads uniformly and rapidly.

Other additives in Calol Multi-Service Oils help remove lacquer and varnish from machine parts and keep them dispersed, and prevent excessive foaming of oil. May be used in all types of oiling systems.

Case 1165—Keeping Grease in Bearings in Hot Conditions



HEAVY-DUTY ROLLER BEARING

Specialized Calol S.A. Grease did not leak from a heavily loaded industrial bearing on a factory machine when surrounding temperatures climbed to 250° F. Its heat resistance was also proved in a series of tests on the Navy Ball Bearing Machine, operated at 10,000 rpm with extremely high bearing temperatures. Adaptable to many services, but especially recommended for anti-friction bearings where radiated temperatures are high. Comes in three grades: Nos. 00, 0 and 1.

A. Very high melting point minimizes seepage through housings and seals.

B. Feeds evenly to all bearing surfaces.

C. Remains soft in cold temperatures — assures good pumpability and thorough lubrication.

To give Calol S.A. Grease unusual heat-resistant qualities, it is made from selected heat-resistant oils and a special sodium-aluminum soap base.

Trademark Reg. U. S. Pat. Office

STANDARD TECHNICAL SERVICE will make your maintenance job easier. If you have a lubrication or fuel problem, your Standard Fuel and Lubricant Engineer or Representative will gladly give you expert help; or write Standard of California, 225 Bush St., San Francisco 20, California.

CALOL

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

List Pacific Coast Officers For '49 IFT Convention

For the convenience of Institute of Food Technologists members throughout the West, Pacific Coast officers for the 1949 IFT Convention, and their business affiliations, are here recorded:

Southern California Section—Chairman: Dr. Arthur N. Prater, Gentray, Inc., Oxnard; Vice-Chairman: Dr. Louis B. Rockland, University of California, Los Angeles; and Secretary-Treas.: Dr. Margaret Morehouse, University of Southern California, Los Angeles.

Northern California Section—Chairman: Ray Junk, California & Hawaiian Sugar Refining Corp., San Francisco; Vice-Chairman: Ernest E. Jacobs, Lyons-Magnus, Inc., San Francisco; Secretary: R. D. McKirahan, American Can Co., San Francisco; and Treasurer: R. N. Berry, American Home Foods, San Jose.

Puget Sound Section—Chairman: Clarence L. Anderson, Washington State Department of Fisheries, Seattle; Vice-Chairman: Dr. Howard Douglas, University of Washington, Seattle; Secretary: Francis P. Owens, Laucks Laboratories, Inc., Seattle; and Treasurer: Arthur J. King, Fisher Flouring Mills Co., Seattle.

See page 143 for details on the National IFT Convention to be held in San Francisco July 10-15, 1949.

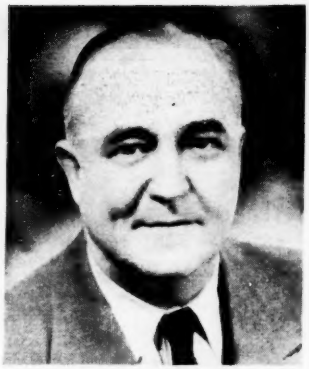
Industry

UTAH'S CANNING CO'S warehouse at Freewater, Ore., was recently destroyed by fire. The plant's entire 1948 pack and part of the 1947 pack of canned fruits and vegetables were lost. Damage was unofficially estimated at $1,000,000. The company hopes to have a new warehouse constructed by June.

THE CASCADE MILK PRODUCTS CO. of Yakima, Wash., and the Gold Star Dairies, Inc., of nearby Selah have formed a $350,000 corporation under the name of Cascade-Gold Start Dairies, Inc.

EXCHANGE ORANGE PRODUCTS CO., Ontario, Calif., an affiliate of California Fruit Growers Exchange, has announced that an extensive expansion program for 1949 includes the construction of a $350,000 cold storage and orange juice concentrate plant. Building was slated to be put under way as this went to press.

INDEPENDENT CREAMERY OPERATORS, INC., at Seattle, Chehalis and Mount Vernon, Wash., has granted a 5c. hourly wage increase, to some 400 affiliated employees in egg and poultry plants. A similar agreement was reached previously with the Washington Cooperative Farmers Assn.



WALTER K. HINES has been appointed general manager of the Sun-Maid Raisin Growers of Calif., located at Fresno. He succeeds W. N. Keeler, who retired after 26 yr. service. Hines joined the cooperative in 1919 as a packing house worker, and in his career he has held the posts of plant superintendent and sales manager.

THE KETCHIKAN COLD STORAGE CO., Ketchikan, Alaska, is building another freezer which will increase its capacity by 30,000 lb. daily. An expenditure of $100,000 is proposed. Pipe installation in the new freezer, adjacent to the firm's present fishhouse, began in February. The plant is affiliated with Citizens Utilities Co.

FRAZAR & HANSEN, LTD., exporting firm, has announced establishment of a food machinery division, to be headed by Arthur G. Caldwell. Formerly with Food Machinery & Chemical Corp., San Jose, Calif., Mr. Caldwell has had 30 years' experience in export sales.

Personnel

WILLIAM V. CRUESS, past chairman of food technology division and a faculty member of University of California since 1911, was hospitalized last January with a broken back suffered when he fell 20 feet from a water tower on his Danville ranch.

R. E. MCCAUGHERN, of the Starr Fruit Products Co., Portland, was elected president of the Northwest Canners Assn., at its annual meeting held in Seattle, January 6-7. Re-elected were T. E. McCaffray, National Fruit Canning Co., Seattle, first vice-president; George Martin, Utah Canning Co., Freewater, Ore., and Pendleton Canning & Frozen Foods Co., Pendleton, Ore., second vice-president; and C. R. Tulley, Portland, executive vice-president.

A. M. ERICKSON, San Jose, Barron-Gray Division of Hawaiian Pineapple Co., is the 1949 president of California Processors & Growers, Inc., Oakland. R. G. Lucks, Sunnyvale, California Packing Corp., is vice-president, and John W. Bristow, Oakland, continues as manager and secretary-treasurer.

MANUEL G. ROSA was elected president of American Tunaboat Assn., San Diego, succeeding Anthony D. Madruga. William A. Hoss was reelected vice-president, and Louis E. DeFalco, secretary-treasurer.

DR. JOHN H. PAINE has been appointed head of the technology department at Hawaii Sugar Planters' Assn. Experiment Station, Honolulu. He succeeds W. L. McCleery, who retired December 31. Dr. Paine, a native of Hartford, Conn., received a B.S. from Butler University in 1927 and a Ph.D. from University of Cincinnati in 1930.

SVERRE N. OMDAHL, farmer of Bow, Wash., has been appointed as the new Washington state director of agriculture by Gov. Arthur Langlie to succeed Fred J. Martin. Omdahl taught school before starting farming in 1943. He now raises specialty crops, grasses, peas and seeds.

WESTERN EVENTS

March, 1949

4- 5—Utah Canners Assn., 37th annual convention, Hotel Utah, Salt Lake City.
9-11—Canners League of Calif., annual convention, Casa Del Rey Hotel, Santa Cruz, Calif.
15-16—National Canners Assn., Northwest Branch, 13th annual canned salmon cutting and production conference, Olympic Hotel, Seattle.

April

12—Monterey Fish Processors Assn., annual meeting, Monterey, Calif.

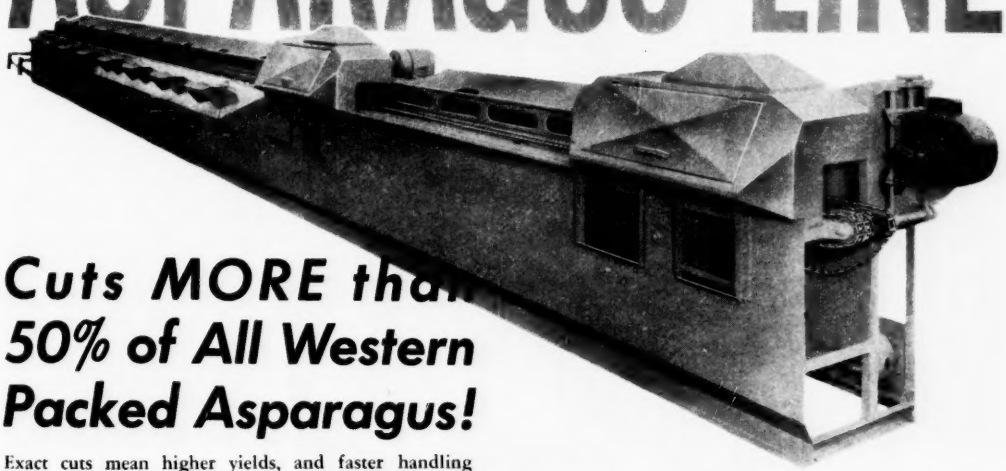
June

4-12—Bay Area Industrial Exposition, Oakland Exposition Bldg., Oakland, Calif.

July

12—Conference on bee plant protection, National Federation of Beekeepers Assns., Seattle.
11-14—Institute of Food Technologists, 9th annual conference, Civic Auditorium, San Francisco.

ATLAS★PACIFIC E&G ASPARAGUS LINE



Cuts MORE than 50% of All Western Packed Asparagus!

Exact cuts mean higher yields, and faster handling means more profit. That's why Western packers use more Atlas-Pacific E&G asparagus lines than all others combined.

Each operator has a turntable on a pedestal conveniently located for asparagus lugs, and the design permits very rapid placing of the stalks on a chain belt. Head ends are aligned against a back belt (not shown) which is timed with the chain belt. The first butt cut is made, and the butts drop to a refuse conveyor located at the rear of the machine. Stalks are then easily aligned by two operators. Next, the can size cut is made—square and accurate—and the butts are either conveyed away for refuse or to the discharge end for canning. Where soup cuts are required, a third knife at the discharge end can be quickly brought into action.

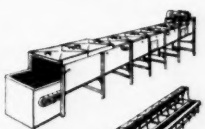
CONSTRUCTION FEATURES: All welded rigid steel frame; large cleanout openings; corrosive resistant chain; variable speed belt and chain drive; high speed knives quickly adjusted for length of cut; heavy flexible hold-down chain to assure accurate cuts.

FREE CATALOG: We would like to send you a copy of our new catalog on streamlined Fillers, Syrupers and Briner. Please make your request on your Company stationery.

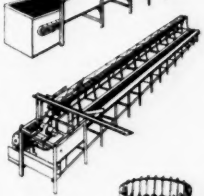
Everything for a more efficient asparagus pack . . .

ATLAS - PACIFIC BRUSH WASHER: Streamline in design and operation. The asparagus emerges thoroughly clean. Two sets of brushes turn the product as a pressure spray thoroughly washes.

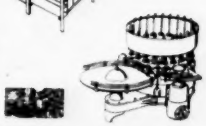
ATLAS-PACIFIC BLANCHER: This unit incorporates all the most modern theory and methods of blanching to bring out the best product color.



ATLAS-PACIFIC MERRY-GO-ROUND CANNING TABLE: The asparagus is brought to the operators by conveyor belt within inches of their reach. Operators work both sides of the table. Asparagus continues around table until packed, allowing no waste.



ATLAS-PACIFIC BRINER: Atlas-Pacific Briners provide extremely uniform and accurate head space with minimum damage to the product. This new high speed, streamline design warrants your investigation.



Manufacturing STANDARD and SPECIAL food processing equipment

ATLAS-PACIFIC ENGINEERING COMPANY, INC.

1321 67th St., Emeryville, Calif.

Your Winning Move for Tubing, Bars and Rods

So varied and exacting are the applications for ultimate end uses of steel tubing, bars and rods that our personnel have become experts in developing winning moves for western industry. Whether it be stainless bi-metal tubing, odd size bushing stock, special physical properties, finishes, shapes or close dimensions, we are ready to attack your problems. Your requirements govern our developments. Check with our customer service engineers as your problems arise.

PACIFIC TUBE COMPANY

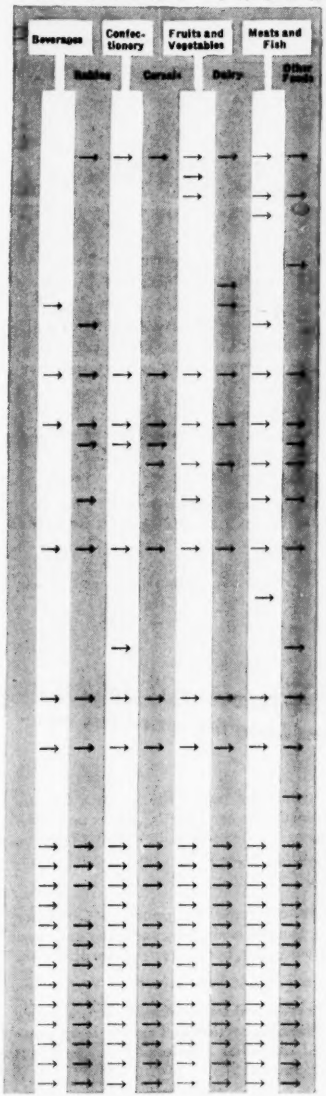
5710 SMITHWAY • LOS ANGELES 22, CALIFORNIA • ANGELUS 2-2151

SEATTLE
ASSOCIATED INDUSTRIES
SEneca 0054

West Coast Distributors
SUPERIOR
TUBE COMPANY

SAN FRANCISCO
R. J. FUITE
MArket 1-7417

INDUSTRY INDEX



Food Industries

MARCH, 1949 • VOL. 21, NO. 3

SPECIAL FEATURES

Lower Costs Needed in Food Distribution.....F. K. Lawler 67
New Technic Speeds Sterilizing of Canned Corn.....Olin Ball 84
British Food Processors Make Best of Bad Situation – II...John H. Nair 108
Abalone Steaks – Trimmed, Sliced, Packaged.....Merle Severn 115

ENGINEERING

High Efficiency Attained on Multi-Product Line.....John V. Ziemba 69
Ice Cream Servings in "Dice" Form.....C. R. Havighorst 74
Bottler Solves Vertical-Plant Problems.....T. G. Ferguson 90
Control Improvements Feature Latest Bake-Oven Practice..E. O. Engels 112

SANITATION

How to Select Detergents for Food Plant Cleaning.....Ira I. Somers 72

QUALITY CONTROL

Restoring Nutritional Values With Natural Substances..Joel B. Peterson 77
Device Automatically Samples Dry, Flowing Materials. Walter C. Wheeler 105
Gasometry – For "Sharper" Control of Food Quality
A. L. Bayes, E. R. Flook and G. B. Graham 87
Spices Stand Up in Freezer Storage.....Wilbur L. du Bois 116

PACKAGING

Code-Dating Provides Simple, Effective Protection.....Ira Gottscho 80

DISTRIBUTION

Is Argentina Looking for New Meat Outlets?.....John Wilhelm 95

FOOD INDUSTRIES REPORT

Candy Progress.....Frank Buese 97

MANAGEMENT

New Court Rulings Clarify Your Legal Liabilities.....Leo T. Parker 106

CONVENTION REPORT

Reduction of Plant Costs Keynotes Materials Handling Show..... 121

FI PICTURE-FLOW SHEET

Salad Dressing and Mayonnaise Manufacture..... 124

EVERY MONTH

Editorials—*Opinions and comments on current problems*.....67 and 117
Talk of the Industry *and* **Hors d'Oeuvres**—*On the lighter side*..... 68
Food Industries Index—*Production trends for 14 basic products*..... 131
New Packages and Products—*Innovations in foods and containers*..... 134
Food Industry News—*Roundup of recent developments*..... 143
Changes in Food Supplies—*Data on output, materials storage*..... 159
What Washington Thinks—*Interpretive comments from the Capital*..... 160
Men, Jobs and Companies—*A spotlight on firms and personalities*..... 163
Food Equipment News—*Better machines for food factories*..... 170
Catalogs and Bulletins—*Literature on equipment and supplies*..... 179
New Technology—*Technical advances reported in abstracts*..... 185
Books—*What's new for the food plant bookshelf*..... 193
Patents—*Machines and processes developed by inventors*..... 195

PUBLISHER.....M. A. Williamson
EDITOR.....Frank K. Lawler
ASSOCIATE EDITOR..E. S. Stateler, Chicago
ASSOCIATE EDITOR..C. R. Havighorst, San Francisco
ASSISTANT EDITOR.....J. A. J. Jones
ASSISTANT EDITOR.....A. V. Gemmill
ASSISTANT EDITOR.....John V. Ziemba
ASSISTANT EDITOR.....F. W. McCarthy
COPY EDITOR.....Herb Powell
ART EDITOR.....Priscilla A. Deutsch
EDITORIAL ASSISTANT.John W. Hinebauch
CONSULTING EDITORS: Laurence V. Burton, New York; R. S. McBride, Washington, D. C.; S. T. Henry, Spruce Pine, N. C.
READER SERVICE.....Alice M. Wilson

WASHINGTON OFFICE.George E. Doying Jr.
WORLD NEWS DIRECTOR
Russell F. Anderson
DIRECTOR ECONOMICS BOARD
Dexter M. Keezer
SALES MANAGER.....L. E. Crist

• • •

FOOD INDUSTRIES is published monthly by McGraw-Hill Publishing Co., Inc. James H. McGraw (1860-1948), Founder; James H. McGraw, Jr., President; Curtis W. McGraw, Vice-President and Treasurer; Eugene Duffield, Executive Assistant for Publications; Nelson Bond, Director of Advertising; Joseph A. Gerardi, Secretary.

PRICE: 35¢ per copy. Subscription rates: U.S. and possessions, $3 for 1 yr., $4 for 2 yrs., $5 for 3 yrs. Canada, $4 for 1 yr., $6 for 2 yrs., $8 for 3 yrs. (payable in Canadian or U.S. funds). Pan American Countries, $5 for 1 yr., $8 for 2 yrs., $10 for 3 yrs. All other countries, $15 for 1 yr., $25 for 2 yrs., $30 for 3 yrs. Indicate position and company on subscription orders. Subscriptions invited only from food processing executives, engineers, technologists, operating supervisors, consultants and laboratories.

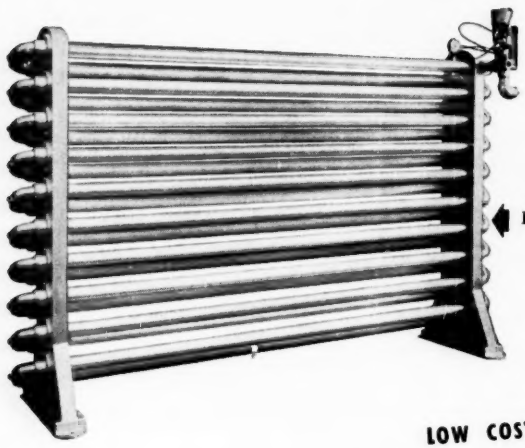
EDITORIAL AND EXECUTIVE OFFICES: 330 West 42nd St., New York 18, N. Y. Cable address: "McGraw-Hill, N. Y." Address correspondence regarding subscriptions to J. E. Blackburn, Jr., Director of Circulation.

PUBLICATION OFFICE: 99-120 N. Broadway, Albany 1, N. Y. Entered as second class matter Aug. 26, 1948, at Albany post office under Act of Mar. 3, 1879. Return postage guaranteed. Member A.B.P. and A.B.C. Indexed monthly in Industrial Arts Index. Copyright 1949, by McGraw-Hill Publishing Co., Inc. All rights reserved.

How You Can

CUT YOUR PROCESS COSTS

with *Carpenter* STAINLESS TUBING . . .



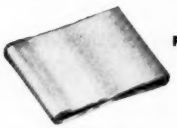
Your equipment costs less because this Stainless Tubing gives you immediate savings of 15% to 40%.

You get full corrosion resistance for your specific jobs. This Stainless Tubing gives you uniform wall thickness that permits the use of lighter gauges. You save dollars when you specify Carpenter Stainless Tubing.

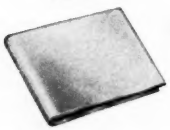
For proof that process costs can be cut today, get in touch with us, just as the manufacturer of this heat exchanger did.

High speed heat transfer and cooling, easy cleaning between runs and freedom from failures that cause wasteful down-time are reasons why Carpenter Stainless Tubing is used for this unit—3" O.D. x 16 gauge on the outside, 1½" x 16 gauge for inside tubes.

LOW COST FABRICATION and TROUBLE-FREE PROCESSING start with the Stainless Tubing that passes these tests—



FLATTENING TEST protects you against the possibility of O.D. defects. Specimen is flattened between parallel plates until distance between plates is 3 times the tube's wall thickness. Any sign of cracking or flaws is cause for rejection.



TRANSVERSE BEND is used to double-check the I.D. structure of Carpenter Stainless Tubing. Sample is slit longitudinally and then bent as in the flattening test, but in the opposite direction.

These tests, made at several stages of manufacture, prove quality of the entire tube section and are made on every lot of full finished Carpenter Stainless Tubing before it is released for shipment.

THE CARPENTER STEEL COMPANY
Alloy Tube Division • 109 Springfield Road, Union, N. J.

Carpenter
STAINLESS TUBING
"MORE THAN CORROSION RESISTANCE"

USEFUL SLIDE CHART gives you information that has never before been available in such easy-to-use form. Data on Physical Properties, Velocity Constants, Mass Velocity Constants, etc. A note on your company letterhead will bring your Slide Chart to you.

Get Action LIKE THIS:

★ **24 hours to make and install coils in 250 HP motor**

★ **Rebuilt 250 HP slip ring motor in 2½ days**

★ **3 days to rebuild 125 HP motor including 200 miles of truck shipment**

THESE ARE ACTUAL JOBS turned out by Giles Armature and Electric Works, Marion, Illinois . . . the kind A-C Certified Service Shops are doing every day!

When every hour costs money . . . when production is stopped . . . Allis-Chalmers Certified Service on motors, transformers, pumps, etc., can get you rolling again, *fast*. Dependable for prompt service on routine work, too.

Call Your A-C Office or Dealer. A-C Certified Service Shops are hand-picked, independent repair shops meeting rigid standards for equipment, trained personnel and business reputation for square dealing. For the one nearest you, ask your Allis-Chalmers Dealer or District Office.

Check with us for *new* motors too. Stock or quick delivery on many sizes, types.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks. A 2594

ALLIS-CHALMERS, 1113A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and District Offices throughout the country.

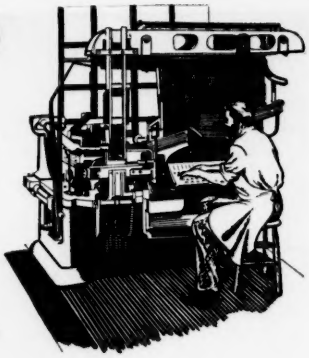
MOTORS — ½ to 25,000 HP and up. Matching Allis-Chalmers Control.

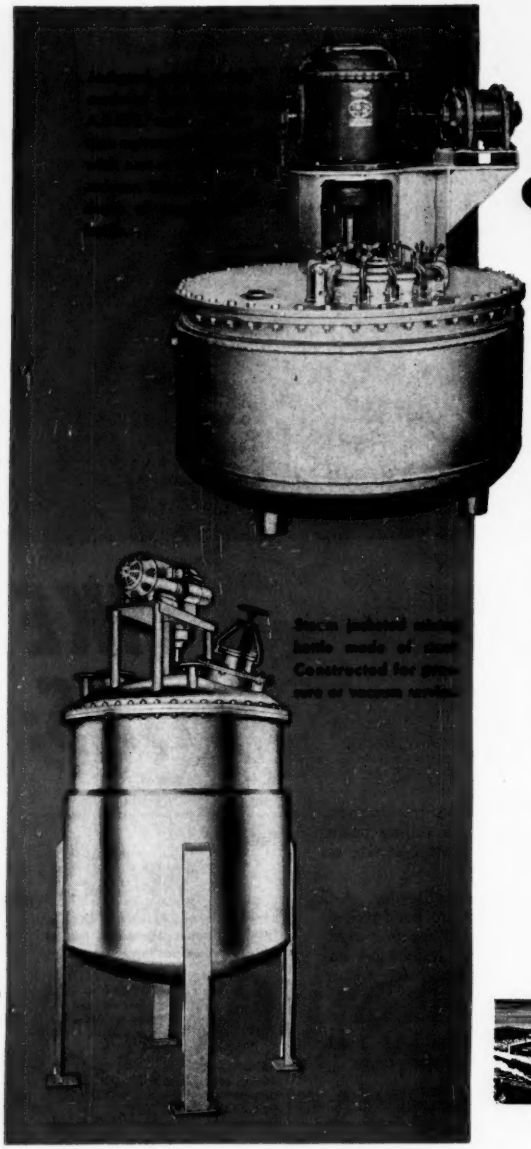
TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

BACK IN THE 1880's

WHEN MERGENTHALER INVENTED THE LINOTYPE MACHINE





Koven

WAS MAKING INDIVIDUALIZED FOOD EQUIPMENT

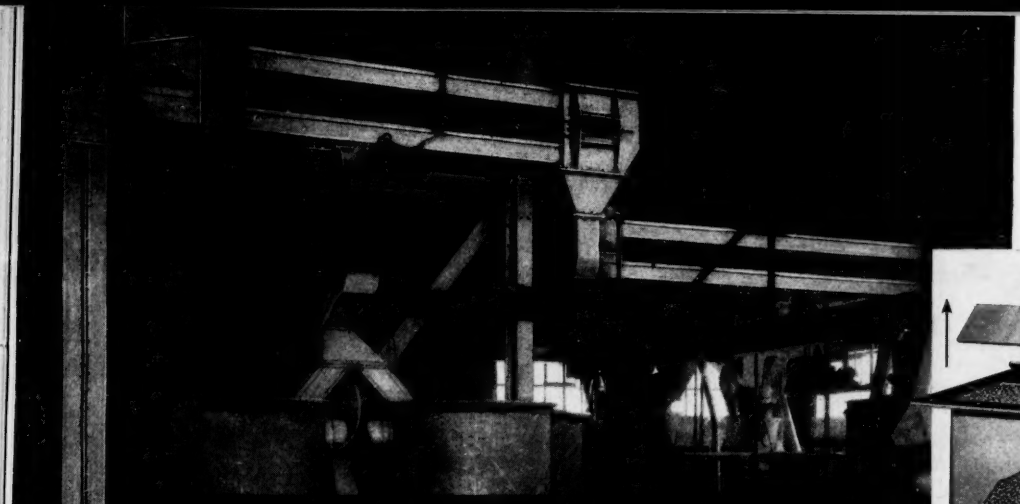
About 68 years ago the printing industry received new impetus from the development of the linotype machine. During this same period the food industries were given a production assist by KOVEN, designers and fabricators of individualized food equipment built to specific requirements. Leaders in the food field have since relied on KOVEN's precision engineering and craftsmanship to turn out economical, efficient equipment that speeds production and trims costs. In our two vast plants are modern machine, welding, painting and galvanizing shops. X-ray inspection insures quality control.

Among the many KOVEN products in all commercial and non-corrosive metals: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical Apparatus; Coils and Pipe Bands; Copper Sheet Fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabricators; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals.

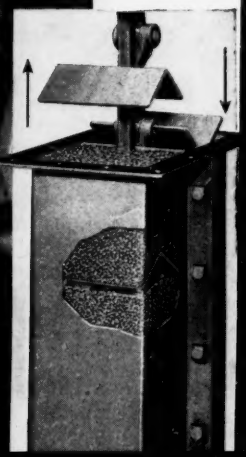
L. O. KOVEN & BRO., INC.
154 Ogden Ave., Jersey City 7, N. J.

Plants:
Jersey City, N. J. Dover, N. J.

KOVEN FOR INDIVIDUALIZED FOOD EQUIPMENT SINCE 1881

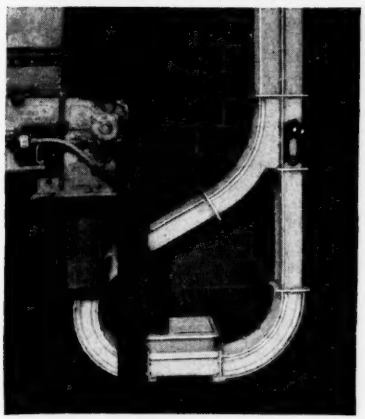


Cut-away view shows chain and flights.



LINK-BELT Bulk-Flo *Streamlines* Your Bulk Materials Handling

Illustrations above and below show typical vertical and horizontal runs of Bulk-Flo in flour mill.



Many types of bulk materials are handled at substantial savings in overall cost, with the simple, compact, Link-Belt Bulk-Flo conveyor-elevator-feeder. Moving steadily along in a compact mass, churning or degradation of the material being handled is minimized, and power consumption is held at a minimum.

The dust-tight casing is compact, occupies minimum space and is largely self-supporting, so that layouts are simplified. Multiple feed and discharge points can be located on horizontal runs.

Book No. 2175 tells the whole story, fully illustrated. Send for a copy and learn the advantages of Bulk-Flo in handling bulk materials in your operation.

TYPES OF LINK-BELT CONVEYING MACHINERY

Belt Conveyors
Screw Conveyors
Bulk-Flo Conveyors
Chain Conveyors
Trolley Conveyors
Apron Conveyors
Oscillating Conveyors
Flight Conveyors
Bucket Elevators
Bucket Carriers

LINK-BELT COMPANY

Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices, Factory Branch Stores and Distributors in Principal Cities. 11.346

LINK-BELT

CONVEYING MACHINERY

"THE COMPLETE LINE"

K&M "Century" Asbestos Corrugated

for long life without maintenance...

The "new" roof on this industrial building is actually more than 3 decades old! A coal operator installed these "Century" Asbestos Corrugated sheets on a coal tipple 33 years ago before he re-used them here.

for modern architectural effect...

Beauty in typically modern style is brought to this store with a facade of "Century" Asbestos Corrugated. This beauty will *last* without any painting or other expensive upkeep.

You've probably noticed that "Century" Asbestos Corrugated is growing in popularity for decorative motifs... inside and outside... for industrial plants, stores, restaurants, theaters. There's a rugged attractiveness in the simplicity of the corrugations and neutral light-gray coloring.

And perhaps it's no news to you that "Century" Asbestos Corrugated is thoroughly practical from the *structural* point of view. It actually *toughens* with age. Never needs to be painted. Can't rot, corrode, catch fire, or succumb to termites.

NEW "TOP-SIDE" FASTENERS CUT ROOFING COSTS

On top of all this, you can specify the new "TOP-SIDE" Fasteners, and cut a big slice off the cost of roof installation over steel purlin construction. Exclusive with "Century" Asbestos Corrugated, these new fasteners permit roofing to be done entirely from *atop the roof* ...eliminating entirely the costly labor and scaffolding normally required beneath. This feature, alone, is worth looking into—write us for full details.

Nature made Asbestos... Keasbey & Mattison has made it serve mankind since 1873

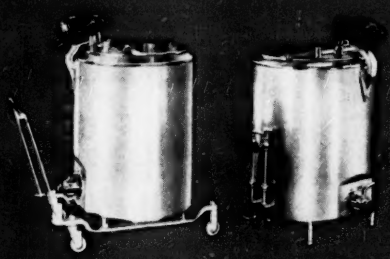
KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

Sanitation begins with Cherry-Burrell

Wherever liquid food or food ingredients are processed, there's a place where you can keep bacteria counts low, maintain product quality and flavor with proven Cherry-Burrell stainless steel pumps, mixing vats, fittings and tubing.

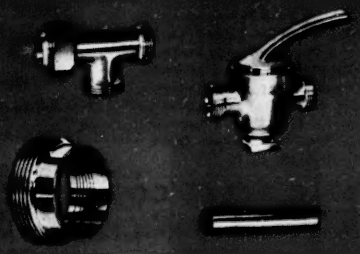
Flexflo Sanitary Pumps

The most outstanding sanitary stainless steel centrifugal pump on the market! Entire pump may be disassembled for washing; all contact surfaces of stainless steel. Sanitary rotary seal—no stuffing boxes. Easily mounted—almost anywhere! Sizes for pumping up to 100,000 pounds per hour. Ask for Bulletin G-374R.



Rollaway Univat Sanitary Mixing Tank

Here's a sturdy, portable, easily cleaned mixing and holding tank available in 50 and 100 gallon sizes—ideal for a number of uses. Agitation is gentle, positive, and uniform for fast heating of the product; lined in sanitary stainless steel. Send for information!



Sanitary Stainless Fittings and Tubing

Cherry-Burrell stainless steel sanitary fittings and tubing are dense and nonporous, hard and non-corrosive, extra long lived. They are completely described, with dimensions, in Bulletin G-443—a valuable asset to have in your files for quick and easy reference. Send for your copy.

Send for Bulletins!

Use this coupon to get copies of the bulletins on the Cherry-Burrell equipment which interests you. And see a Cherry-Burrell representative for complete information on Cherry-Burrell sanitary food processing equipment.

CHERRY-BURRELL CORPORATION

General Sales and Executive Office:
427 W. Randolph Street, Chicago 6, Ill.
Milk and Food Plant Equipment and Supplies
FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 56 CITIES

trendmaker in a great industry

CHERRY-BURRELL CORPORATION
Dept. 117, 427 W. Randolph St., Chicago 6, Ill.

☐ **Send information on Vogt Freezers.**
☐ **Send Bulletin G-369.**

Name.....

Firm Name.....

Address.....

City..... **State**.....

FREE... all this helpful TUBING Data

Whatever your questions about Republic ELECTRUNITE Tubing, you'll find the answers in this helpful literature:

1. **Boiler, Heat Exchanger and Condenser Tube Brochure.**
2. **Stainless Steel Tubing and Pipe Handbook.**
3. **Mechanical Tube Tolerance Guide.**
4. **Process Industries Tubing Brochure.**
5. **General Product Design Brochure.**
6. **Electric Metallic Tubing Brochure.**
7. **Structural Steel Tubing Brochure.**
8. **Dewey Process for Configured Tubing (Description of)**
9. **Structural Steel Tubing Fabricating Guide**
10. **Boiler Tube Maintenance Chart.**
11. **Size Range Cards.**

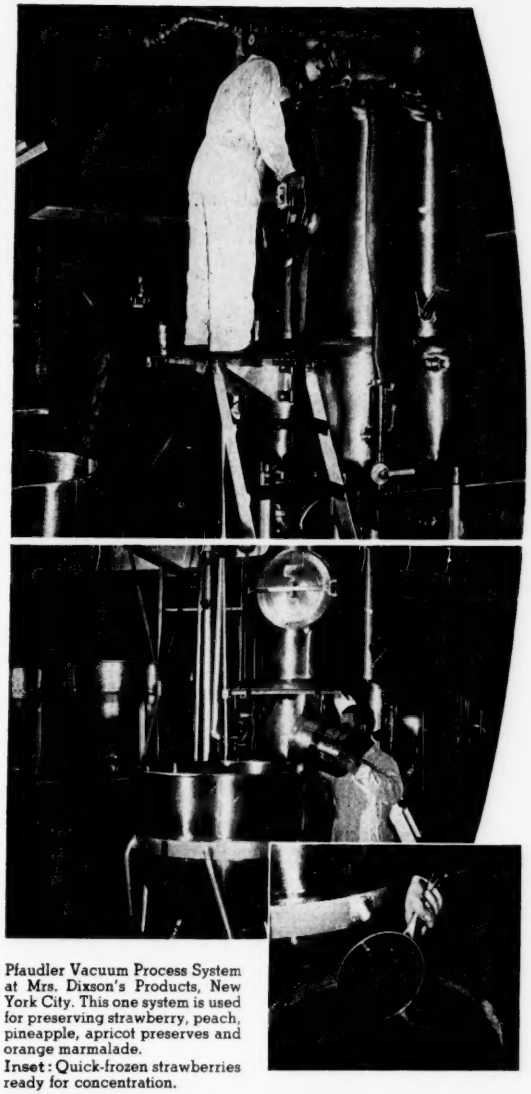
REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Department: Chrysler Building, New York 17, New York

SEND COUPON *Today!*

Republic Steel Corporation, Steel and Tubes Division
Department D, 224 East 131st Street, Cleveland 8, Ohio
Please send me the tubing data which I have checked below:

Name _____ *Title* _____
Company _____
Address _____
City _____ *Zone* _____ *State* _____
1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____

HOW TO PUT MORE SELL INTO YOUR PRODUCTS



Pfaudler Vacuum Process System at Mrs. Dixson's Products, New York City. This one system is used for preserving strawberry, peach, pineapple, apricot preserves and orange marmalade.
Inset: Quick-frozen strawberries ready for concentration.

In these days of super-markets, consumers judge your product strictly on merit. In the field of preserves, it's a rare consumer who does not recognize the larger bulk and fresher taste and brilliant appearance of Pfaudler vacuum processed fruit preserves.

Mrs. Dixson's Products is a case in point. Since installing the closed Pfaudler Vacuum System, uniform quality has been obtained through accurate control. Fruit does not fall apart. It's more evenly dispersed through the juice. Color and taste is much improved. All of this is the result of accurate control at lower operating temperatures.

You can assure yourselves of identical results you know, by doing a similar processing job. Pfaudler know-how shows you just what is needed, and how it's done. The principle applies as much to citrus juices, tomato paste and similar products as it does to fruit preserves. Let us help you put more sell into your products . . . now. Call one of our offices and you will get prompt attention.

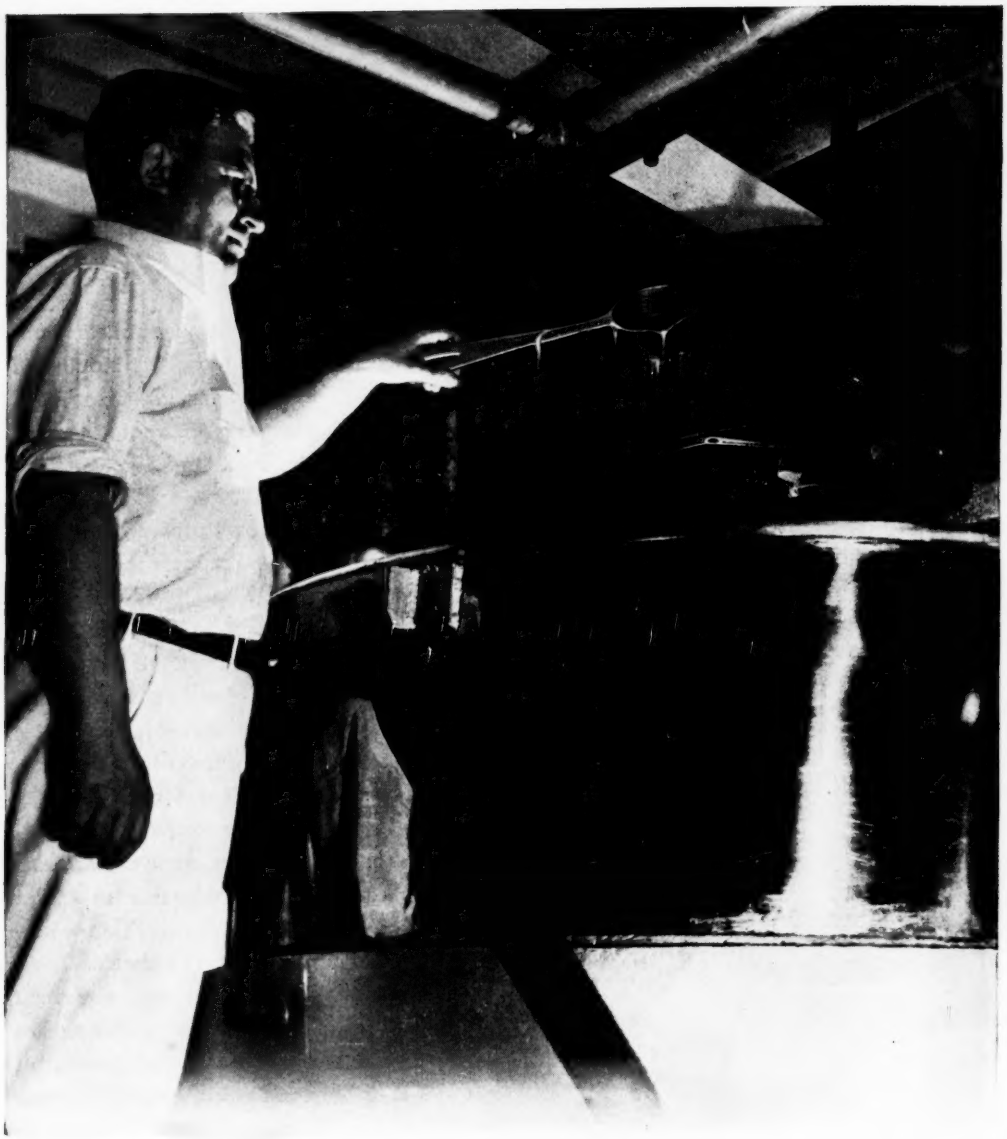
Pfaudler

THE PFAUDLER CO., Rochester 3, N. Y. Branch Offices: 330 West 42nd St., New York 18, N. Y.; 111 W. Washington Ave., Chicago 2, Ill.; 1328 Howard St., San Francisco 3, Calif.; 818 Olive St., St. Louis 1, Mo.; 63 West Milwaukee Ave., Detroit 2, Mich.; 1318 1st Nat'l Bank Bldg., Cincinnati 2, O.; 1041 Commercial Trs. Bldg., Philadelphia 2, Pa.; 751 Little Bldg., Boston 16, Mass.; 334 Chattanooga Bank Bldg., Chattanooga, Tenn.; P.O. Box 4066, Dallas, Texas; Enamelled Metal Products Corp., Ltd., Artillery House, Artillery Row, London, S. W. 1, England.

THE PFAUDLER CO., ROCHESTER 3, NEW YORK

ENGINEERS AND FABRICATORS OF FOOD PROCESSING EQUIPMENT

Glass-Lined Steel . . . Stainless Steels . . . Nickel . . . Inconel . . . Monel Metal



REPUBLIC STEEL

Enduro

REG. U. S. PAT. OFF.

STEAM-JACKETED KETTLES OF ENDURO STAINLESS STEEL help to assure "original" taste, flavor and purity of processed food products at the dining table. Other ENDURO applications include sorting tables, sinks, hoppers, mixing tanks, pails, utensils, sanitary piping, valves and fittings—practically every type of processing, packing, packaging and distribution equipment used throughout all phases of the food industry.

...AND NOW FOR LOWER MAINTENANCE COSTS

Equipment made of Republic ENDURO Stainless Steel offers many maintenance advantages. Faster, easier cleaning . . . fewer production interruptions . . . substantially lengthened equipment life . . . all result from the adoption of stainless steel for food processing equipment.

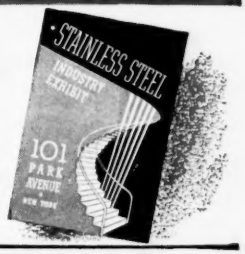
ENDURO is not an ordinary metal. It is unusually strong and tough—highly resistant to wear, rough usage and abuse. It is as inherently clean and easy to keep clean as glass. Like glass, too, it is unaffected by food products and has no effect upon them. These qualities, plus the fact that it never needs refinishing or resurfacing, make ENDURO a match for the most exacting food requirements.

There are many ENDURO analyses, each designed to meet specific application needs. Talk with your equipment manufacturer or write for more information.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

STAINLESS STEEL

✓ ***Check ALL 10 Advantages:*** • RUST AND CORROSION-RESISTANCE • HEAT-RESISTANCE • HIGH STRENGTH • EYE APPEAL • NO METALLIC CONTAMINATION • SANITARY SURFACES • EASY TO CLEAN • EASY TO FABRICATE • LONG LIFE • LOW COST



MOTOR STARTERS

MADE FOR EXTRA LONG LIFE, GREATER FLEXIBILITY!

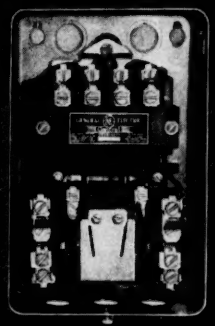
They're here—G-E magnetic motor starters in a complete all-new line! Here are all the best features, all the popular sizes. See for yourself what makes these starters ideal for control of your food plant motors. Check for yourself advantages such as these:

Extra long life New, 'Strongbox' magnet coil, locked in a tough plastic block, protects windings against shorts caused by moisture-filled grain dust or food particles, against damage from slipping screwdrivers during wiring. Silver contacts are made to take millions of operations. New magnet construction gives quick, positive, "make-and-break" contact.

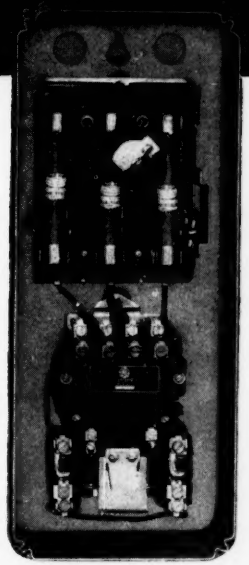
Greater flexibility Main poles up to NEMA size 1—and interlocks in all sizes up to 3—can be changed from normally open to normally closed with no extra parts needed. A finger flip changes the overload relays from hand to automatic reset. Contacts can be quickly exposed for inspection, and replaced if necessary without disturbing wiring, for easier maintenance.

These new, improved motor starters are available now for induction motors up to 50 hp, which covers most food plant drive needs. Get all the facts. Send for the informative new bulletins listed in coupon. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC



Note the convenience features of the new G-E motor starter. Shallow case, front-located terminals, easy-working terminal clamps, large pan-head screws, handy knockouts—these all help simplify and speed wiring.



See how the new G-E *combination starter* saves food plant space and simplifies installation. In addition to the starter with its motor-protecting overload relays, it includes in one single, compact unit a new, rotary-action fused disconnect switch for circuit isolation and short circuit protection, required by N.E.C.

Team up these starters with

TRI/CLAD

REG. U.S. PAT. OFF.

FOOD PLANT MOTORS!

The new G-E line of motor starters makes a worthy partner for the famous G-E Tri-Clad motor family. Used together, they'll help eliminate costly breakdowns that hold up a food processing line, cause lost production and spoilage of foods in process. Tri-Clad motors, at no extra cost, provide three-fold extra protection against physical damage, against electrical breakdown, against operating wear and tear. Here are a few Tri-Clad motor types widely used in food plants:

Tri-Clad Open Drippproof Motor A reputation for on-the-job dependability identifies this general-purpose "workhorse" motor. Vital parts are protected against dripping liquids, falling objects, external blows. See Bulletin GEA-3580.

Tri-Clad Totally Enclosed Non-ventilated Motor Sealed to keep out food particles, liquids, and splashings from frequent hosings, this motor is a "natural" for use in breweries, canneries, dairies, bottling works, ice-cream works. See Bulletin GEA-4082.

Tri-Clad ACA Adjustable-speed Motor Filling the needs of over two-thirds of all food plants using adjustable-speed drives, this a-c motor provides stepless speed adjustment with fingertip control over speed ranges 3:1, 6:1, and 20:1 on ovens, pumps, conveyors, etc. See Bulletin GEA-4883.

Tri-Clad Gear-motor On reduced speed drives, this compact motor saves space and maintenance by eliminating the need for mechanical couplings and speed reducers. Gears are sealed in the motor, with no dripping oil to mess up floors. See Bulletin GEA-1437.

WANT MORE DATA?

General Electric Company, Section A653-38
Apparatus Department, Schenectady 5, N. Y.

Please send me the following bulletins:

- ..... GEA-1437—Gear motors
- ..... GEA-3580—Open drippproof motors
- ..... GEA-4082—Totally enclosed motors
- ..... GEA-4883—ACA motors
- ..... GEA-5153—A-c motor starters
- ..... GEA-5156—Combination a-c starters

Name.....

Company.....

Street.....

City.....State.....

Better-Built

FOR THE LONG PULL

Engineered in GMC's modern, new Engineering Laboratories . . . among the finest in the industry . . . and only one example of the complete facilities of this largest exclusive producer of commercial vehicles.

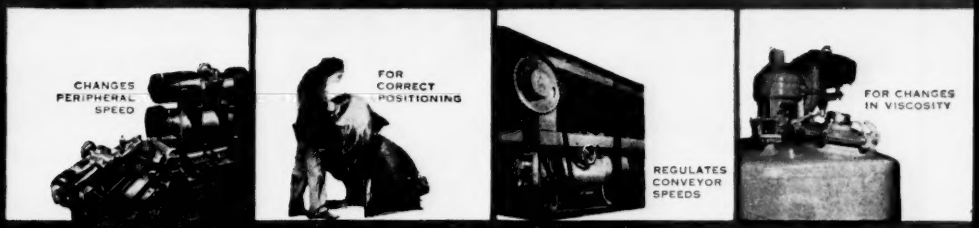
Tested on the famous General Motors Proving Ground . . . where GMCs are subjected to exhaustive engineering tests and operated for thousands of miles under some of the world's roughest, toughest road conditions.

Proved for millions of economical, dependable miles. Endorsed by hundreds of thousands of owners and operators covering every truck transport vocation. Backed by forty years of truck building experience.

These are some of the reasons why GMC Trucks are Worth More

THE KEY TO GREATER TRUCK VALUE

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION



These are only a few of the many, many types of applications where Master Speedrangers can help you do a better job. These Speedrangers with their stepless variable speed operation assure exactly the right speed for every operation . . . for each operator . . . the right speeds for each change in the consistency or shape of the material being processed. Such variable speed operation gives you plus value in higher rates of production, a better quality product and more efficient performance of your equipment and your operators.

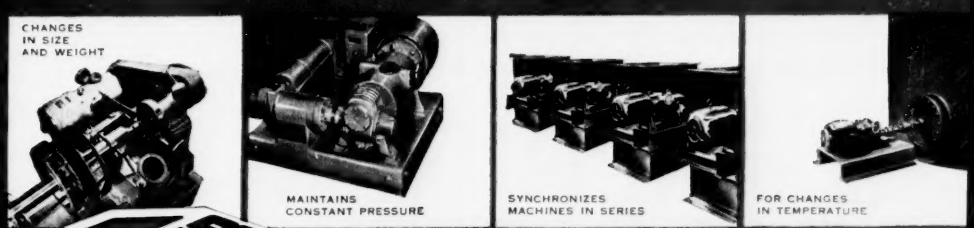
Master Speedrangers provide this infinitely variable speed in compact, all-metal, mechanical variable speed units in a wide range of types and in sizes up to 5 horsepower.

make a good job better

An extra feature of Master Speedrangers is their extreme flexibility, for they can be made to incorporate an electric motor, a variable speed unit, a gear reduction unit and an electric brake . . . all standard Master units that easily combine into a compact, integral power package. This provides exactly the RIGHT horsepower, the RIGHT range of speed, the RIGHT features, in a unit that you can use RIGHT where you want it.

Write for Data 7525, a new 24-page book on Speedrangers, and see what a real job they can do for you.

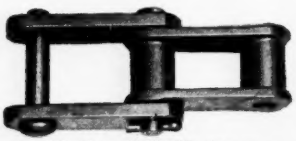
THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



MASTER SPEEDRANGERS

CHAINS, SPROCKETS and ATTACHMENTS

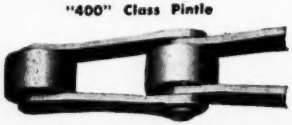
Detachable Link—Malleable Iron, SUPERMAL or PERDURO



Combination—Malleable Iron or SUPERMAL Block Links and Steel side bars.

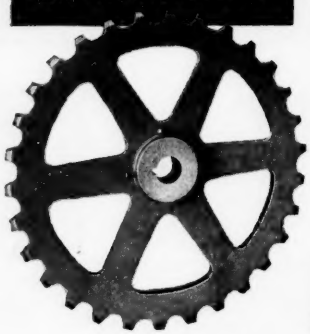
"H" Type Mill—Malleable Iron, SUPERMAL or PERDURO

"400" Class Pintle

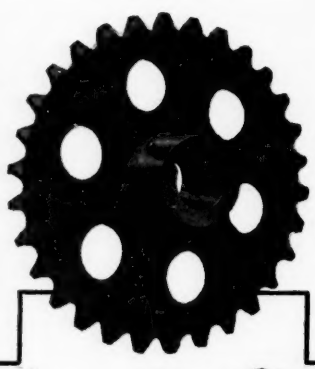


Malleable Roller—Malleable Iron, SUPERMAL or PERDURO

Steel Thimble Roller with straight or offset side bars



For every Elevating, Conveying and Driving need. Easy to select the right type and size from the broad Jeffrey line.



Long Pitch Steel Thimble Roller with plain or flanged rollers

"800" Class Steel Bushed

Steel Knuckle

Transfer

Steel Block in various types

"H" Type Refuse—Malleable Iron or SUPERMAL

A-1

F-2

H-2

K-2

A-42 with C-wing

G-6

S-1

THE JEFFREY MANUFACTURING COMPANY Established 1877

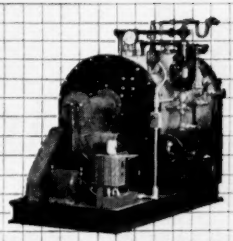
927 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

JM

Baltimore 2, Birmingham 3, Boston 16, Buffalo 2, Chicago 1, Cincinnati 2, Cleveland 13, Denver 2, Detroit 13, Harlan, Houston 5, Huntington 19, Jacksonville 2, Milwaukee 2, New York 7, Philadelphia 3, Pittsburgh 22, St. Louis 1, Salt Lake City 1, Scranton 3

LITTLE GEM

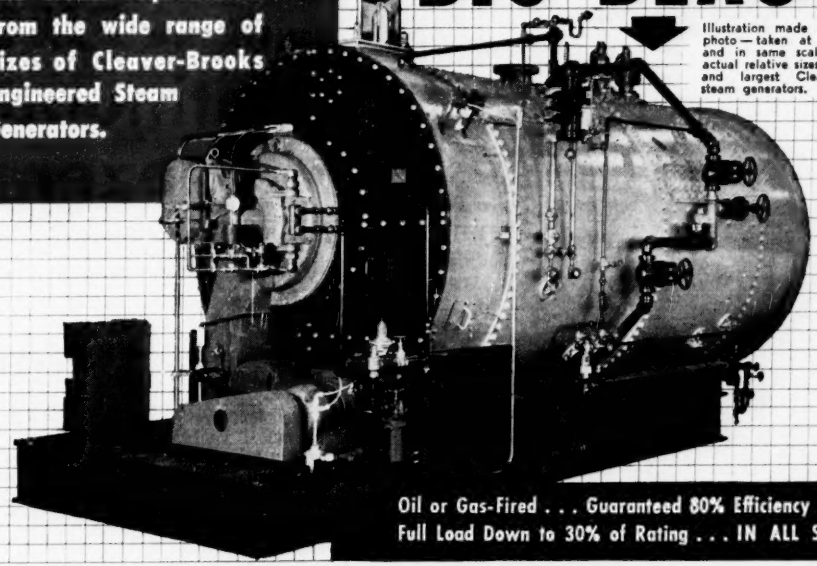


or

BIG BEAUTY

Select to meet your space and steam requirements from the wide range of sizes of Cleaver-Brooks Engineered Steam Generators.

Illustration made from actual photo — taken at same time and in same scale — showing actual relative sizes of smallest and largest Cleaver-Brooks steam generators.



Oil or Gas-Fired . . . Guaranteed 80% Efficiency from Full Load Down to 30% of Rating . . . IN ALL SIZES

WHY search and "shop" for a boiler — install a Cleaver-Brooks engineered and packaged steam generator that fully meets your steam requirements and needs only a minimum of space and headroom.

You can select from a range of sizes 15 to 500 hp. — and you can have your Cleaver-Brooks steam generator equipped for oil, gas, or with a combination burner which permits alternate use of gas or oil and provides for a quick change-over from one fuel to the other.

Equally important—you get Cleaver-Brooks guarantee of at least 80% efficiency from full load down to 30% of rating — with either gas or oil as fuel — and IN ALL SIZES.

Cleaver-Brooks steam generators enable you to burn the available fuel in your area — give you clean, smokeless operation — eliminate fuel and ash handling — need no high or costly stacks — no special foundations — fit under low headroom and into limited space — provide flexible operation to meet fluctuating loads — fully meet all codes.

Available in a size to fit your needs — 15 to 200 p.s.i., 15 to 500 hp. — write for Cleaver-Brooks Steam Generator bulletin.

CLEAVER-BROOKS COMPANY, 352 E. Keefe Ave., Milwaukee 12, Wis.

WRITE on your business letterhead for Free Steam Cost Calculator — a ready reference slide rule showing the comparative steam costs when using oil, gas or coal as fuel.

Cleaver-Brooks

"Packaged" STEAM GENERATORS

HAVE SERVED INDUSTRY FOR MORE THAN FIFTEEN YEARS

NOW

"Assembly-Line" Production of FROZEN FOODS

with the FMC Continuous Freezer

Here's the first major improvement in the food freezing process since the original plate freezer came into use. It . . .

Speeds up the Process
Freezes Thoroughly
Operates Automatically
Freezes Continuously

The FMC Continuous Freezer saves time, trouble, and labor. It's the result of many years research in the food freezing field. Freezes 1½ to 2 tons of prepackaged produce per hour, depending upon the type of produce processed and the refrigerant temperature. Combines big capacity with minimum floor space.

This machine operates automatically so that cartons are handled in a smooth-flowing continuous fashion: rapid heat transfer with cartons of food in sliding contact with refrigerated surfaces.

Talk with your nearest FMC representative or write direct for full information on this new advance in commercial food freezing.

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

FOOD MACHINERY AND CHEMICAL CORPORATION

ANDERSON-BARNGROVER DIVISION
General Sales Office
SAN JOSE 5, CALIFORNIA

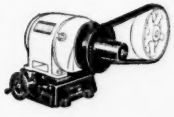
SEATTLE • PORTLAND • LOS ANGELES • HOOPESTON, ILLINOIS (SPRAGUE-SELLS DIVISION)

"No, no, Bascom! Just a screwdriver!
This machine is Reeves-equipped!"

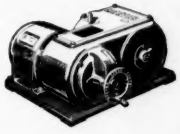
THE 3 BASIC REEVES UNITS

VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over a wide range—2:1 to 16:1. Sizes—fractional to 87 hp.

VARI-SPEED MOTOR PULLEY provides an instantly variable speed drive within 4:1 ratio for any constant speed motor. Sizes to 15 hp.



MOTODRIVE combines motor, speed varying mechanism and reduction gears in single unit. Speed variations 2:1 to 6:1 inclusive. Sizes to 20 hp.



Maintenance of machines equipped with REEVES Speed Control requires no special tools—no special training. REEVES units incorporate an operating principle proved in more than 260,000 installations. Simplicity of design and rugged construction throughout, with all working parts easily accessible, assure low-cost, trouble-free service. And on the job, REEVES Variable Speed Drives give you smooth, instant speed changes—provide *exactly* the right speed for every job under every changing condition. Result: increased production . . . improved, uniform quality . . . lower production costs. Install REEVES Speed Control on machines now in service—specify "REEVES-equipped" whenever you buy new machines.

• • •

FREE! A new, 16-page handbook no production man should be without, entitled "REEVES Automatic Production Control." Contains comprehensive information on the application of automatic production control to many different machines, under widely varying conditions. Write today for Catalog No. FD39-G487.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

Recognized Leader in the Specialized Field of Speed Control Engineering

ACCURATE • VARIABLE
Reeves Speed Control
GIVES THE RIGHT SPEED FOR EVERY JOB!

STURTEVANT

Dustless BLENDERS

Produce Perfectly Mixed Products with NO Loss of Materials

RECEIVING

The ingredients to be mixed enter the mixing chamber of the drum through a chute. Note scoops which carry up and dump the ingredients as the drum rotates.

DISCHARGING

By simply throwing a lever, the inlet is closed and the mixer is in discharging position. The completely mixed materials drop off the lifting scoops and discharge through chute without segregation of ingredients.

Four-way mixing action produces homogeneous blends. No matter what the densities, weights, finenesses or other physical properties of the ingredients, Sturtevant Dustless Blenders provide *a thoroughly blended product* with no substances floating to remain unmixed. Sturtevant advantages include—single opening for both receiving and discharging . . . "open door" accessibility for quick, thorough cleaning . . . rugged construction for long life and minimum maintenance. Sturtevant Dustless Blenders are available in mixing capacities from 500 to 20,000 pounds. Write for information or engineering assistance.

STURTEVANT MILL COMPANY
106 CLAYTON STREET, BOSTON 22, MASS.

Designers and Manufacturers of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

5 MONEY SAVING ADVANTAGES of the CONKEY INTEGRAL EVAPORATOR

Erection time generally *one quarter* that required for other types.

Vapor body, heating element, entrainment separator and flash chamber constructed in one common shell which is set into place in one operation.

As much as 30% reduction in floor space.

No external entrainment separators and flash chambers.

Negligible pressure drop

Due to streamlining of design and integration of construction.

Increased evaporator capacity.

Due to great reduction of pressure drop.

Minimum maintenance.

Design has eliminated many flanged joints and a space exists between shell and outer row of tubes wide enough for a man to walk through and inspect tubes.

OTHER GENERAL AMERICAN EQUIPMENT

Drum Dryers	Thickeners	Roller Presses
Rotary Dryers	Filters	Screw Presses

Turbo-Hydrogenators • Thickening Screens

Citrus Process • Malek Rice Process

Ask a General American engineer for more information on how these money saving advantages can be applied to your particular evaporation problem.

GENERAL AMERICAN TRANSPORTATION CORPORATION

Process Equipment Division

SALES OFFICE: 10 East 49th St., Dept. 840, New York 17, N. Y.

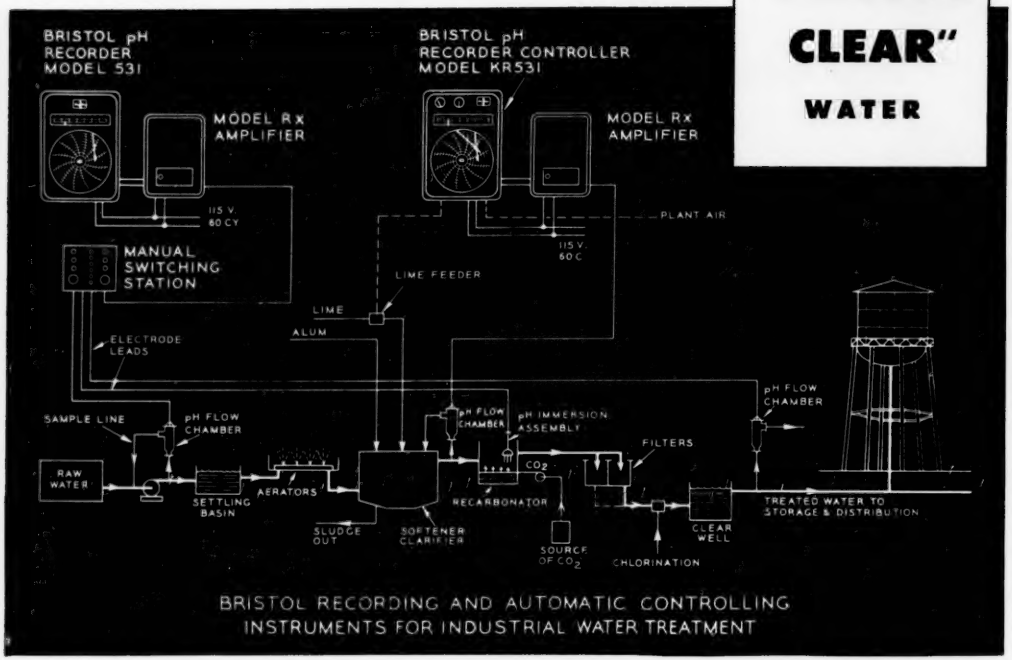
WORKS: Sharon, Pa., East Chicago, Ind.

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

OFFICES: Chicago, Cleveland, Louisville, Orlando, Pittsburgh, St. Louis, Salt Lake City, Sharon, Washington, D. C.

Wash Down Your Processing Costs

WITH
"BRISTOL CLEAR" WATER



BRISTOL RECORDING AND AUTOMATIC CONTROLLING INSTRUMENTS FOR INDUSTRIAL WATER TREATMENT

Controlling Water Treatment with Instruments Improves Each Process Using Water —Lowers Purification Costs

When Bristol recording and control instruments take over the problem of preparing water for use in cooling, washing, blanching, mixing, scalding and other purposes, processing efficiency goes up, water purification cost goes down, food quality goes up.

Automatic control of water treatment provides a supply of water of the correct pH value, regardless of varying raw water conditions. And it makes the water "Bristol-Clear" at much less expense than without the automatic control feature.

As the diagram shows, Bristol pH instruments keep an eye on raw water and apply the exact amount of treatment needed for uniform purity. The complete installation of recorders and controllers pays for itself in savings made in process work and in reducing supervision of water treatment.

Write for Bulletin pH1302 on Bristol Continuous pH Recorders and Controllers and investigate Bristol instruments, too, for recording and automatically controlling temperatures, flow, liquid level and pressure. THE BRISTOL COMPANY, 115, Waterbury 91, Conn. (The Bristol Co. of Canada, Ltd., Toronto, Ont. Bristol's Instrument Co., Ltd., Lynch Lane, Weymouth, Dorset, England.)

60 YEARS...1889-1949

BRISTOL

Engineers Process Control for Better Products and Profits

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

Employees like this easy-to-handle aluminum equipment

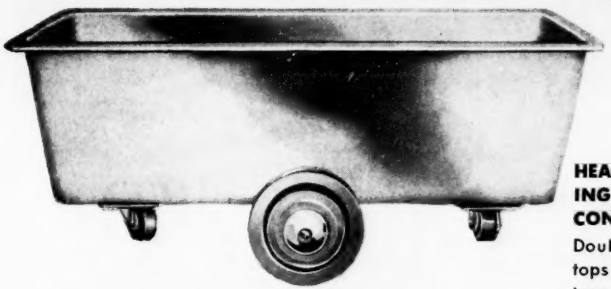
Light-in-weight Wear-Ever aluminum equipment brings cheers from the men who work with it, for it means less fatigue. It brings cheers, too, from those responsible for efficiency and *operating* costs. For the super-tough alloy from which Wear-Ever aluminum food equipment is made resists gouging and denting — gives many extra years of hard service. Mail the coupon below for full information on Wear-Ever Aluminum food plant equipment. The Aluminum Cooking Utensil Co., Wear-Ever Bldg., New Kensington, Pa.

TUBS

[illegible] and reinforcing ring on [illegible] closed with continuous weld, [illegible] weld on handles. [illegible]. Capacities 26 and 33 qts.

STAINLESS PAILS

Strong and durable, in natural or Alumilite finish. Capacities 10, 12, 14, 16 quarts.



FOOD TRUCKS

Strong aluminum body. 14 cu. ft. capacity. Continuous welds eliminate cracks and crevices. St. John Neotread wheels.

HEAVY DUTY INGREDIENT CONTAINERS

Double-thick tops and bottoms. Beveled edges. 15 sizes from 8 to 200 qts.

WEAR-EVER

Aluminum

WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.

The Aluminum Cooking Utensil Co.
303 Wear-Ever Bldg., New Kensington, Pa.

Please send me further information about your

☐ Tubs ☐ Pails ☐ Food Trucks
☐ Ingredient Containers ☐ Complete Line

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

If Service is your job . . . Demand

REEVES ARMY TWILL

For longer-lasting, better-looking uniforms

Consider how important these two benefits are for your industrial uniforms and work clothes.

1. **Better appearance**—Reeves Army Twill cuts and tailors exceptionally well. It washes and irons well. It's comfortable to wear. These factors boost employee morale and build customer good will.

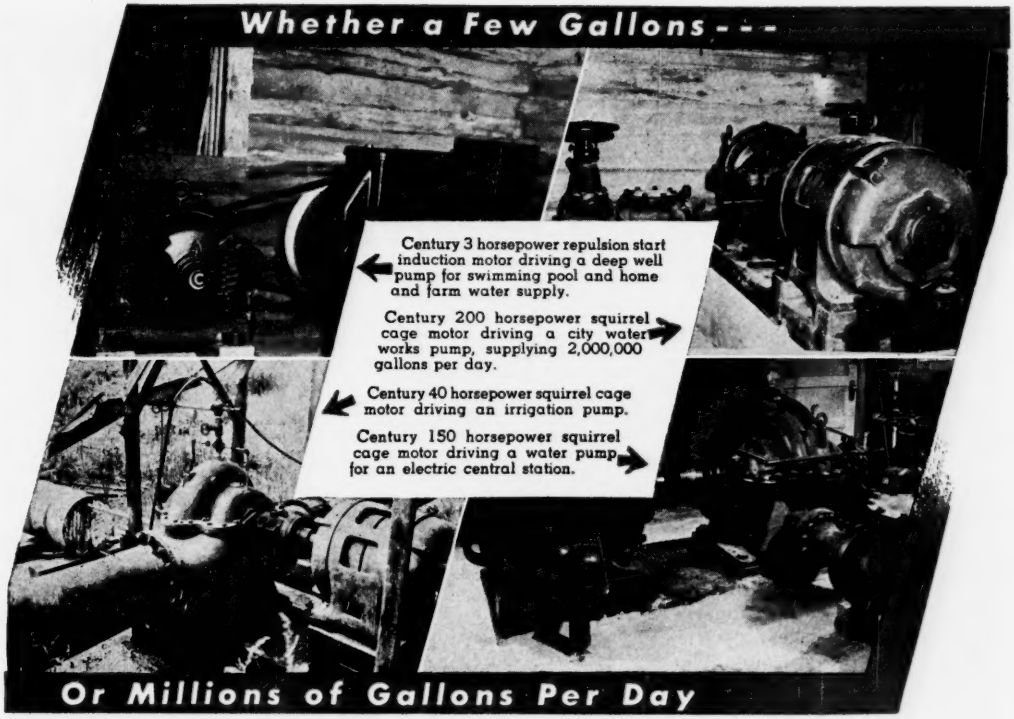
2. **Longer wear**—means big savings for years to come, because "first" costs are spread out longer. Thus the high quality of Reeves Army Twill is the most economical fabric you can specify!

Reeves Army Twill is a thoroughly tested, high-quality, combed cotton, Sanforized, fabric. (Residual shrinkage is less than 1%.) Over 100 million yards have been delivered to the Armed Services—exceeding rigid Government specifications. It comes in a wide range of vat-dyed colors fast to sun, water and perspiration. It is one of many durable fabrics made by Reeves for industrial purposes. Write for full details concerning your industry.

"FROM COTTON TO CUTTER"

REEVES BROTHERS, INC. 54 WORTH STREET, NEW YORK 13, N. Y.

REPRESENTATIVES IN: *Akron • Atlanta • Boston • Chicago • Dallas • Los Angeles • Philadelphia • Portland, Oregon • St. Louis • Montreal • Toronto*


Whether a Few Gallons - - -
Century 3 horsepower repulsion start induction motor driving a deep well pump for swimming pool and home and farm water supply.
Century 200 horsepower squirrel cage motor driving a city water works pump, supplying 2,000,000 gallons per day.
Century 40 horsepower squirrel cage motor driving an irrigation pump.
Century 150 horsepower squirrel cage motor driving a water pump for an electric central station.
Or Millions of Gallons Per Day

CENTURY MOTORS

Supply *Dependable Power*

Over a million Century motor driven pump installations in use is proof of Century's acceptance in the pumping field. These installations range in size from water systems for small cottages to city water systems pumping millions of gallons per day.

In addition to water pumps, Century motors supply power for milk, liquid food and beverage pumps, brine pumps, bilge pumps, pulp pumps, dye pumps, acid pumps, alkali pumps, oil well pumps, and gasoline pumps.

Century pump motors are particularly adapted to the requirements of pumping service. They start and run smoothly and quietly—and with a minimum of vibration Century's triple insulation effectively resists humidity and dampness.

To meet the requirements of any surrounding atmosphere, Century motors are supplied with drip proof, splash proof, totally enclosed fan cooled or explosion proof frames.

Century builds a complete line of electric motors in sizes from 1/6 to 400 horsepower to meet the requirements of industrial and commercial needs.

Specify Century motors for all your electric power requirements.

Century C MOTORS

Popular types and standard ratings are generally available from factory and branch office stocks.

CE-598

EXIDE-IRONCLAD BATTERIES

are DIFFERENT!

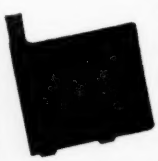
dependable power

Storage batteries are called upon to perform many tasks. No single type of battery is adequately suited for all. Exide engineers have developed batteries designed to fit each power requirement. They differ in a number of ways, but chiefly in the positive plate around which the other elements are built. In the Ironclad line there are three basic types:

DESIGNED FOR STATIONARY USE

The manchester type of positive plate has the unique lead button construction...rolled strips of corrugated lead, pressed into holes of lead antimony grid. It is widely used by electric utilities, telephone and telegraph companies, radio and television stations... and for railway signal systems, emergency lighting and other stationary applications.

DESIGNED FOR AUTOMOBILE USE



The Exide flat positive plate is of staggered grid construction, pasted with active material which years of experience has proved most efficient and durable for the services for which it was designed. Used for starting, lighting, ignition and other services in cars, trucks, buses, aircraft and general storage battery tasks.

DESIGNED FOR MOTIVE POWER

The Exide-Ironclad positive plate, of slotted tube construction, was developed by Exide Engineers to provide a battery of extra power, sturdiness and durability to meet the exacting needs of motive power equipment. Exide-Ironclad Batteries are noted for high capacity and ability to deliver adequate power throughout each shift. Fully described on opposite page.

1888

DEPENDABLE BATTERIES FOR 61 YEARS

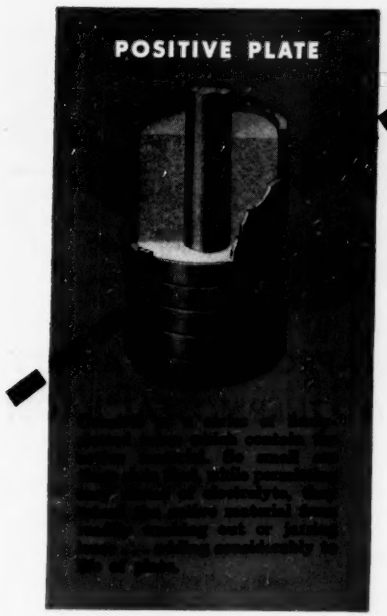
1949

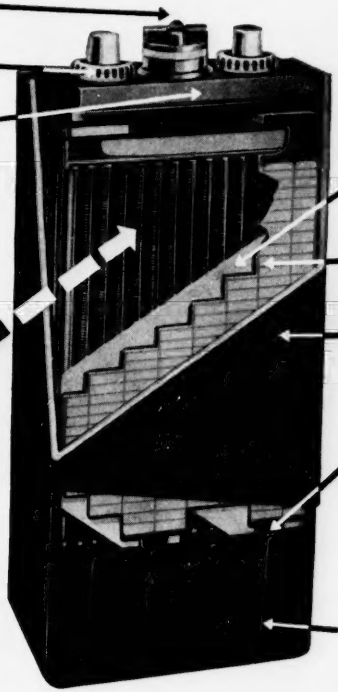
Many Outstanding Features

VENT PLUG
Specially designed to prevent escape of electrolyte.

GREASE SEAL RING NUT
Holds battery elements securely in place . . . prevents creepage of electrolyte . . . keeps tops clean and dry.

SEALED CELL COVER
Flush with top of jar. Prevents collection of dirt or moisture . . . keeps impurities out of cell . . . eliminates leakage of electrolyte.





SEPARATOR
Of high porosity, specially treated to last the life of the battery.

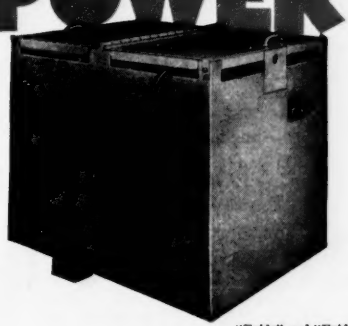
NEGATIVE PLATE
Made extra heavy and built to match the long life of the positive plate.

JAR
Made of specially tough and durable Giant Compound. Built to withstand the jolts and jars of hard industrial usage. Practically unbreakable in normal service.

FEET
Internal short circuits practically eliminated by having the two feet on negative plate rest on different ribs from those of the positive plate, and by having separators extend below both plates and rest on all four ribs.

RIBS
Support all plates and separators. Their height provides generous sediment space, so that internal cleaning is unnecessary.

DEPENDABLE POWER



Exide-Ironclad Batteries have ALL FOUR of the characteristics that a storage battery must have to assure maximum performance from battery electric industrial trucks—high power ability, high electrical efficiency, ruggedness and a long life with minimum maintenance. The combination of these four Exide-Ironclad characteristics assures years of dependable day-in, day-out service with economy.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

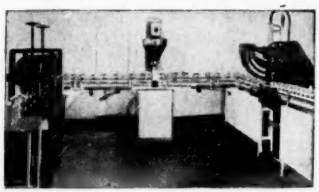
"Exide" and "Exide-Ironclad"
Reg. Trade-marks U.S. Pat. Off.

Q: WHAT ALL-IMPORTANT FEATURE DO THESE BAGS HAVE IN COMMON?

A: THE UNIQUE, FOOD-PROTECTING ABILITY OF BETNER PATENTED THERMOSEAL* BAGS!

Our demon statistician, trying hard not to show bias, has figured that just about 20% more protection is given by Betner Thermoseal* Bags.

If he is very far wrong, we'll hear from our competitors. If he is close to right, we should be hearing from you. Because—any food processor who is proud of his product, who wants it delivered to consumer in the best possible shape, won't be happy 'til he knows all about Thermoseal*, the heat-sealed bag.



Bag inserter, filler and heat sealer for filling and closing bags in cartons.

Those five products shown above —and a raft of other eminent U. S. foods are bodyguarded from plant to pantry by Thermoseal*. If you'd like a package for *your* product that is sift-proof, moisture-vapor-proof, that keeps insects *out* and flavor *in*, ask us about Thermoseal*.

*Trade Mark Reg. U. S. Patent Office

Benj C Betner Co DEVON, PA.

BENJ C BETNER CO of CALIFORNIA, LOS ANGELES, CAL.

A complete bag service—from idea to finished bag to machinery for closing coffee bags and filling and closing liner bags for cartons.

ANNOUNCING

Easy to Clean
Handles High-Temperature Products

HERE'S a *new* Allis-Chalmers machine for the food processing industry. It's the Low-Head *all-metal* gyratory sifter. Frame is of steel construction, box and sieves are made of lightweight magnesium.

Entire unit is easy to clean and *safe to wash*. Production downtime during operation changeover can be sharply reduced because of this easy-to-clean feature.

The new Allis-Chalmers all-metal sifter is built *strong* for long, dependable service. Use of lightweight magnesium contributes to sifter's smooth performance.

Rated at the same high speed and same high capacity as the standard Low-Head sifter, this new all-metal unit offers an opportunity for *improved* sanitation in the grading and resifting of various food processing ingredients. All riveted joints are gasket-sealed to eliminate possible leakage of fine materials. And because it is all metal, there is no chance for cracks or crevices to develop after installation.

High temperature products are no barrier to its operation because there are no wooden parts to be affected.

The new Low-Head all-metal gyratory sifter is available *now*—ready for prompt delivery.

Low-Head is an Allis-Chalmers trademark.

Send coupon below for handy information packet with details on this new all-metal sifter and a copy of bulletin 06B6124A on the standard Low-Head sifter.

A 2632

ALLIS-CHALMERS, 1113A SO. 70 ST. MILWAUKEE, WIS.

☐ Please send handy packet with information on new All-Metal sifter and standard sifter bulletin 06B6124A.

☐ Would like personal visit from A-C representative with details of new sifter.

Name .....

Company .....

Street .....

City ..... State .....

ALLIS-CHALMERS

Serving the Food Industry for 102 Years

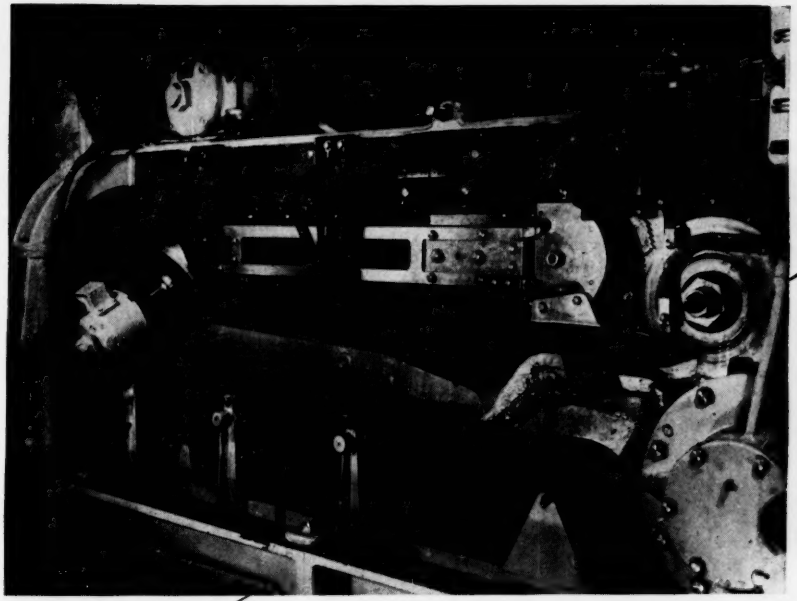
Among Specialty Bag Companies

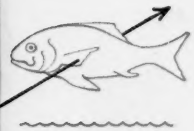
12 out of 12 buy Riegel

All twelve of the largest specialty bag companies buy Riegel Papers regularly

Among the makers of specialty bags, and in many other fields, you will find most of the sales leaders are regular Riegel customers. They buy from us because they know we can make packaging and industrial papers that combine technical excellence with economy and production efficiency. Their confidence in Riegel is an important reason why your company—whether large or small—should see if we can also help you. Write to Riegel Paper Corporation, 342 Madison Avenue, New York 17, N. Y.

Riegel Papers **We produce over 600 different packaging, printing, converting and industrial papers. If we don't have what you want, we can probably make it.**





Stainless Steel plays an important part in this automatic fish filleting machine — the key equipment for the continuous processing of cod, haddock, etc. It took nearly 20 years and cost almost $1,000,000 to perfect this machine for whose development the Atlantic Coast Fisheries Co. was last year given the first Award for Food Technology Achievement.

STAINLESS STEEL is a "natural"

for continuous processing equipment

● Continuous processing offers the food plant operator an effective means of offsetting the constantly rising cost of labor and materials.

Results already obtained in completely mechanized and streamlined plants clearly indicate that continuous processing not only ensures better quality control but materially lowers production costs. This is especially true when Stainless Steel is used generously in the equipment and machinery—for Stainless has exactly what it takes to make continuous processing really *continuous*.

Because it cleans so quickly and easily . . . because it is so much stronger and tougher than other materials . . . because it offers superior corrosion resistance and safely withstands extremes of heat and cold, Stainless Steel reduces production line interruptions and shutdowns to the very minimum.

Furthermore, because Stainless Steel is chemically inert in the presence of practically all food products and adds no metallic flavor or contamination to whatever food is in process, its use in continuous processing lines makes it possible to switch from one food to another with perfect safety and with least delay.

If you want the best results from continuous processing equipment make sure it is made of the finest Stainless Steel—U·S·S Stainless. For here is a complete family of *perfected*, special-purpose steels that will meet almost any requirement of food plant service. Our engineers are specialists in its use and will gladly assist you in selecting the proper type to ensure the greatest benefits from its application.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

SHEETS • STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

8-1601

UNITED STATES STEEL

TEPCO

SODIUM BENZOATE
U. S. P.

CINNAMIC ALDEHYDE

BENZOIC ACID

Tennessee Products & Chemical Corporation

General Office: NASHVILLE, TENNESSEE

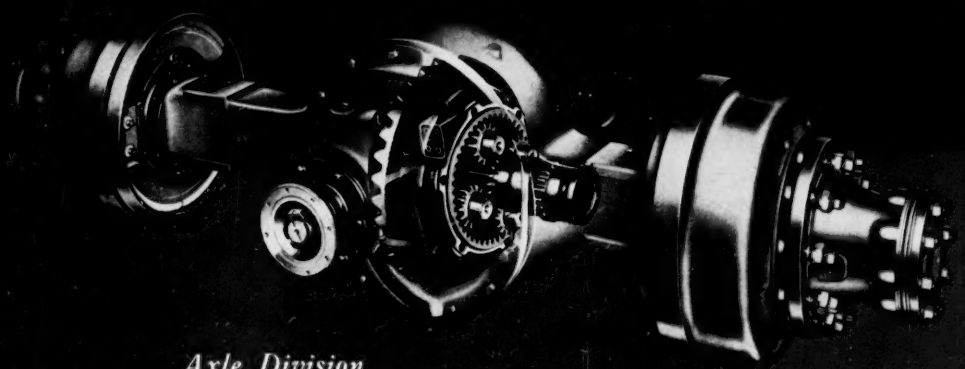
Eastern Sales Office: 350 Fifth Avenue, New York 1, N. Y.

EATON AXLES

Planetary Design Reduces Gear Wear — Makes Eaton Axles Last Longer

An important factor in the long life of the Eaton Axle is its planetary design. This exclusive Eaton feature reduces stress and wear on gears and bearings, adds miles and miles of trouble-free life, holds maintenance to a minimum. * * * On trucks of the 1½-ton class and larger, Eaton 2-Speed Axles provide a balanced combination of power and speed that adds utility to the vehicle and reduces operating and upkeep costs. See your dealer for complete information.

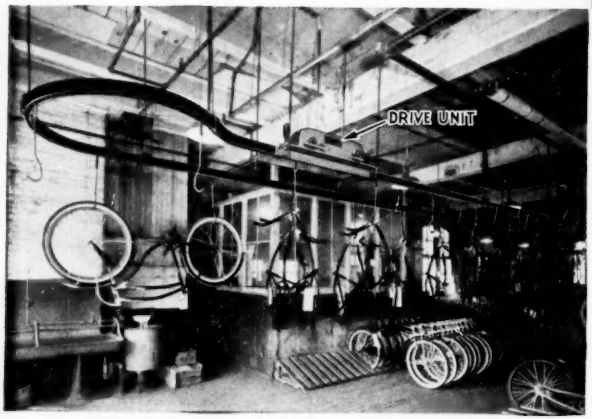
More Than a Million Eaton 2-Speed Axles in Trucks Today



Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

OTHER EATON PRODUCTS

Bananas or Bicycles



There's a Richards-Wilcox Conveyor for Every Job

In *your* plant, no matter what the handling problem or how difficult the layout, Richards-Wilcox Conveying Equipment can lower costs and speed production. Find out which R-W Conveyor most advantageously fits your production picture.

1. *Tru-Tred Beam Track Over-Way Systems*—For heavy duty handling and electric hoist service—eight different sizes of track. Designed to handle heavy loads over long spans without superstructure—capacity 8,000 pounds.

2. *Lock-Joint Trolley Track and Ball-Bearing Hangers*—Tubular track systems for handling lighter loads with maximum flexibility—capacity 3,000 pounds.

3. *Zig-Zag Continuous Power Conveyor*—For smooth continuous movement of light loads within confined areas, and the handling of products through de-greasers, dip tanks, spray booths, drying ovens or similar applications.

Your nearest Richards-Wilcox branch will gladly furnish you with full details and complete engineering consultation without obligation.

1880 RICHARDS WILCOX R-W AURORA TRADE MARK Reg. U. S. Pat. Off. 1949

OVER 69 YEARS

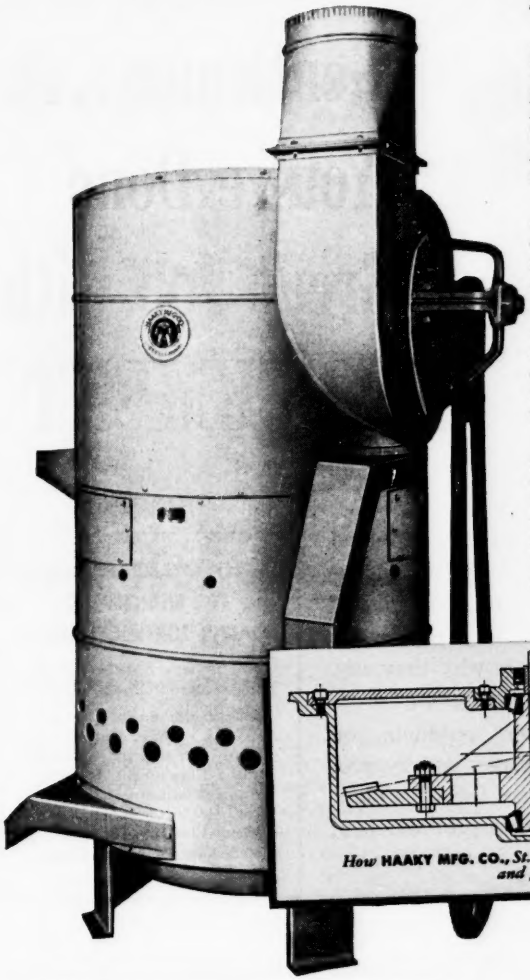
Richards-Wilcox Mfg. Co.

"A HANGER FOR ANY DOOR THAT SLIDES"

AURORA, ILLINOIS, U.S.A.

Branches: New York Chicago Boston Philadelphia Cleveland Cincinnati Washington, D. C. Indianapolis St. Louis New Orleans Des Moines Minneapolis Kansas City Los Angeles San Francisco Denver Seattle Detroit Atlanta Pittsburgh

Cleans grain thoroughly and dependably on TIMKEN® bearings

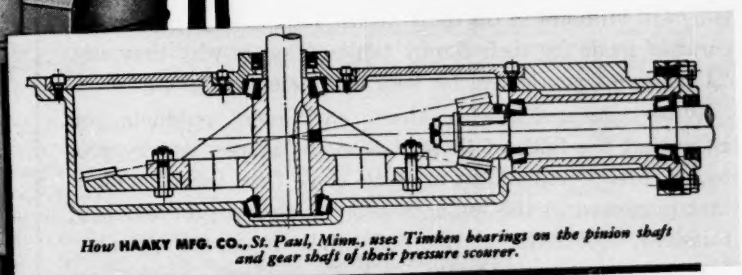


THE new Haaky pressure scourer cleans grain by true grain-against-grain action—like rubbing it between the palms of the hands. Timken® bearings help it to operate more efficiently and dependably by practically eliminating friction and wear and holding moving parts in constant alignment. Because Timken bearings permit the use of closures which effectively retain lubricant, oil and grease cannot contaminate the grain.

Timken bearings are tapered in construction—carry any combination of radial and thrust loads without deflection or end-play. They're manufactured to incredible accuracy and finished to amazing smoothness to assure precision and minimize friction.

The line contact between rolls and races provides maximum load capacity in minimum space. And since they're made of the finest material ever developed for tapered roller bearings—Timken fine alloy steel—Timken tapered roller bearings normally last the life of the machine.

No other bearing can bring you *all* the advantages you get with Timken bearings—backed by 50 years of bearing research and development. That's why it's so important to make sure you have Timken bearings in every machine you manufacture or buy. Look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



How **HAAKY MFG. CO.**, *St. Paul, Minn., uses Timken bearings on the pinion shaft and gear shaft of their pressure scourer.*

This symbol on a product means its bearings are the best.

TIMKEN BEARING CAPACITY RATINGS INCREASED 25%

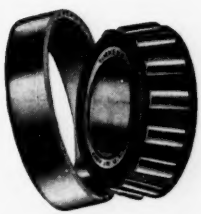
Since Timken bearings were last re-rated some 15 years ago there has been such a further and constant improvement in quality that we are now able to announce a 25% increase in radial and thrust load carrying capacity. This may make possible the use of smaller bearings with savings in bearing cost, material cost and weight. Engineers will be able to utilize the advantages of Timken bearings in more applications than in the past.

A new Timken Engineering Journal, now in preparation, will give you complete capacity rating tabulations. For further assistance, write us today.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ◫ ← LOADS OR ANY COMBINATION ✳

"Gentlemen... You've Done a Great Job with ENRICHMENT"

If you who read this are the makers of an enriched food product, the gratitude of millions of women is yours.

For American homemakers know well the importance of sufficient vitamins in the daily meals. That is why they choose *enriched* foods for their family tables. That is why they say, "Thank you, gentlemen, for your enrichment program."

When you enrich with Merck enrichment products you *know* that the faith of those millions of women is fully protected. Merck enrichment products come from the same plant that pioneered in the research and large-scale production of thiamine, riboflavin, niacin, and other important vitamins. MERCK *KNOWS* VITAMINS.

MERCK VITAMIN PRODUCTS FOR ENRICHMENT AND FORTIFICATION

For Millers, Bakers, Cereal and Macaroni Manufacturers

Merck Enrichment Ingredients • Merck Vitamin Mixtures for Flour Enrichment • Merck Bread-Enrichment Wafers • Merck Vitamin Mixtures for Corn-Products Enrichment • Merck Vitamin Mixtures and Wafers for Macaroni Enrichment.

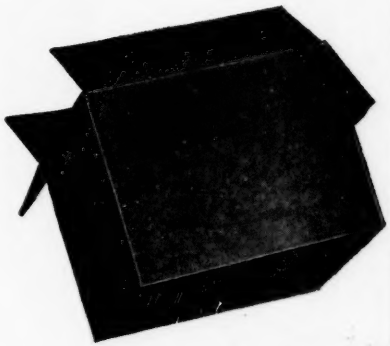
MERCK VITAMIN PRODUCTS
for
ENRICHMENT and FORTIFICATION

MERCK & CO., Inc. *Manufacturing Chemists* RAHWAY, N. J.

MERCK

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Chicago, Ill. • Elkton, Va. • Los Angeles, Calif.
In Canada: MERCK & CO., Ltd. Montreal • Toronto • Valleyfield

The proof of value is the Pedigree . . . . . *In boxes, too!*



PROOF OF *Quality*
PROOF OF *Service*
PROOF OF *Fair Price*

THE ENGLISH SETTER, stately in appearance, has been favored as an excellent bird-dog by sportsmen for almost four centuries. He is very gentle and lovable in disposition. He needs plenty of space and exercise in order to be happy, so never confine him to close quarters!

A box with a pedigree? Yes, you can trace a Union 100% Kraft corrugated container all the way back to Union's own forests. Every step in manufacture, from tree to finished box, is quality-controlled by *one* responsible management, operators of the largest Kraft pulp-to-container mill in the world.

And more than that: For more than 75 years Union has been the leader in paper packaging, producing specification bags for hundreds of industries.

The same skill in production, the same vast forest resources and mass production economies which have put Union at the top in paper packaging have also built a containerboard business which last year accounted for nearly 6% of America's total tonnage of Kraft boxes.

Today Union's board is going into corrugated containers bearing the pedigree mark of the famous Union shield.

This emblem identifies an organization which, for three quarters of a century, has been fully conscious of its responsibilities to customers who must depend on the reliability of their container source for the continued operation of their own plants.

UNION *Corrugated Containers*

UNION BAG & *Paper Corporation*

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

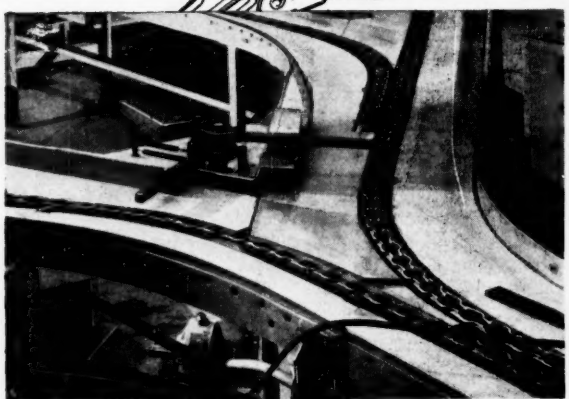
Corrugated Container Plants: **SAVANNAH, GA. • CHICAGO, ILL. • TRENTON, N. J.**

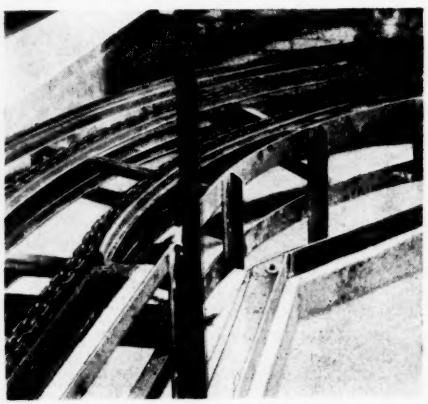
flexibility *that saves floor space!*

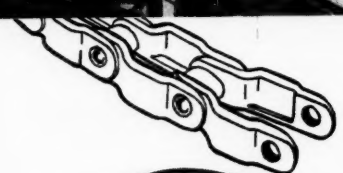
• Rex Double-Flex Chains help you make the most effective use of your floor space . . . simplify conveyor set-ups. Their unique ability to flex in two planes enables them to make horizontal turns, thus making it possible to weave around beams and other obstructions.

These space-saving chains provide an ideal means for carrying cartons, boxes, large cans, packages and parts into and away from plant unloading or delivery points. They are also effectively used in packing lines and assembly tables.

Rex Double-Flex Chains are made of Rex Z-Metal for maximum resistance to corrosion and abrasive sliding wear. Links have added wearing surfaces on sliding edges. Rex Double-Flex will outlast any similar type chain. For all the facts, call your local Rex Field Office or write Chain Belt Company, 1616 West Bruce Street, Milwaukee 4, Wis.







• *Rex Double-Flex Chains can be turned to converge at one delivery point to considerably simplify handling problems and step up efficiency.*

• *The ability of Rex Double-Flex to weave around obstructions simplifies conveyor set-ups . . . makes most effective use of floor space.*

CHAIN BELT REX COMPANY . . . DRIVE AND CONVEYOR CHAINS

ASK STOKES

Dry in SECONDS with Stokes Drum Dryers

TEN seconds more or less . . . 10 degrees higher or lower . . . are often the difference between success and failure in a food drying process.

The continuous drying of slurries and solutions of heat-sensitive materials is often feasible and profitable only when accomplished in *seconds* . . . especially for such products as starch, gluten, cooked cereals, whole and skim milk, soluble coffee, and brewers yeast.

Stokes drum dryers are "application-designed" to fit the precise needs of your product. Moisture content, consistency, heat sensitivity, required production rate, and all other factors are carefully analyzed before a recommendation is made.

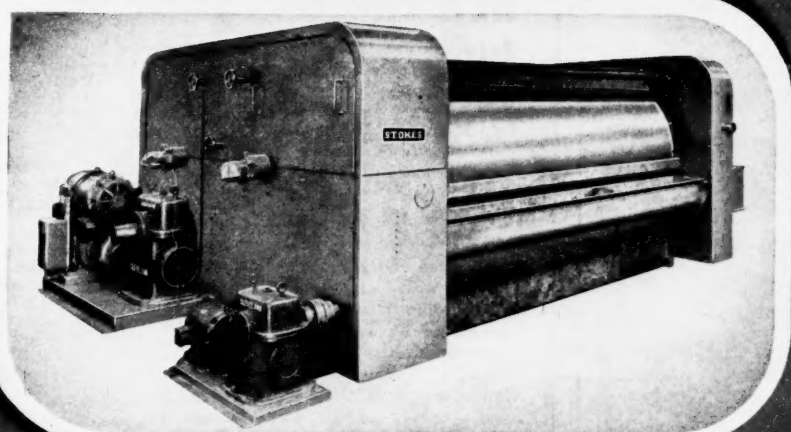
. . . and you can test the procedure in the Stokes semi-plant-scale laboratory.

If you have any problem in drying, it may be worth while to let Stokes work with you.

F. J. Stokes Machine Company,
5976 Tabor Rd., Phila. 20, Pa.

FJS

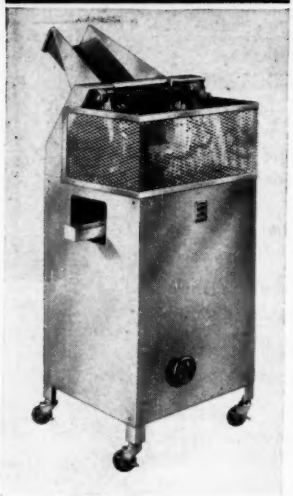
Stokes makes Vacuum and Special Processing equipment, High Vacuum Pumps and Gages, Pharmaceutical equipment, Industrial Tabletting and Powder Metal Presses, Plastics Molding Presses, Water Stills and Special Machinery.



This double drum unit is one of many sizes and types of drum dryers built by Stokes for the processing industries.

STOKES KNOWS HOW

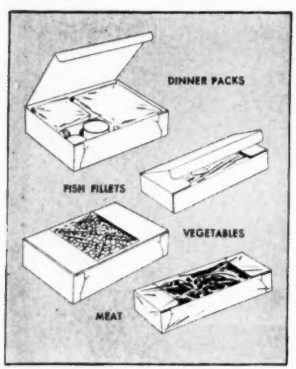
What's new at General Mills



Sets up 5400 cartons per hour

Food packers converting to tray-type cartons are cutting their packaging costs with the new General Mills Tray-Lock Machine. It sets up lock-type trays and cartons automatically at speeds up to 90 per minute, eliminating slow, expensive hand methods. Another saving results from using blanks that require no pre-gluing.

Three square feet of floor space will house the Tray-Lock Machine. It is equipped with locking casters for easy portability and plugs into your regular 110-volt outlets.



The machine turns out cartons in a variety of sizes and styles, including waxed and unwaxed types with or without cellophane windows. In addition it handles hinge-cover cartons popular for noodles, crackers, quick dinners, etc. All are neatly squared with sturdy, straight sides.

NEW CARTON SET-UP MACHINE turns out stronger cartons faster

Flat carton blanks are converted into ready-to-fill trays and cartons *automatically* with this new packaging unit. The machine requires practically no supervision and its output is adjustable to the speed of your filling operation (up to 90 units per minute).

The Tray-Lock Machine produces cartons with locking ends, a design that eliminates the extra cost of pre-gluing blanks and helps speed operation. Carton sizes range from 1″ to 2½″ in side-wall height, up to 4″ in end-wall height, 2″ to 6″ in width and 4″ to 13″ in length. Change-over from one carton size to another is a simple 10-minute job.

THE COMPANION FINISHED-EDGE CARTON SET-UP MACHINE

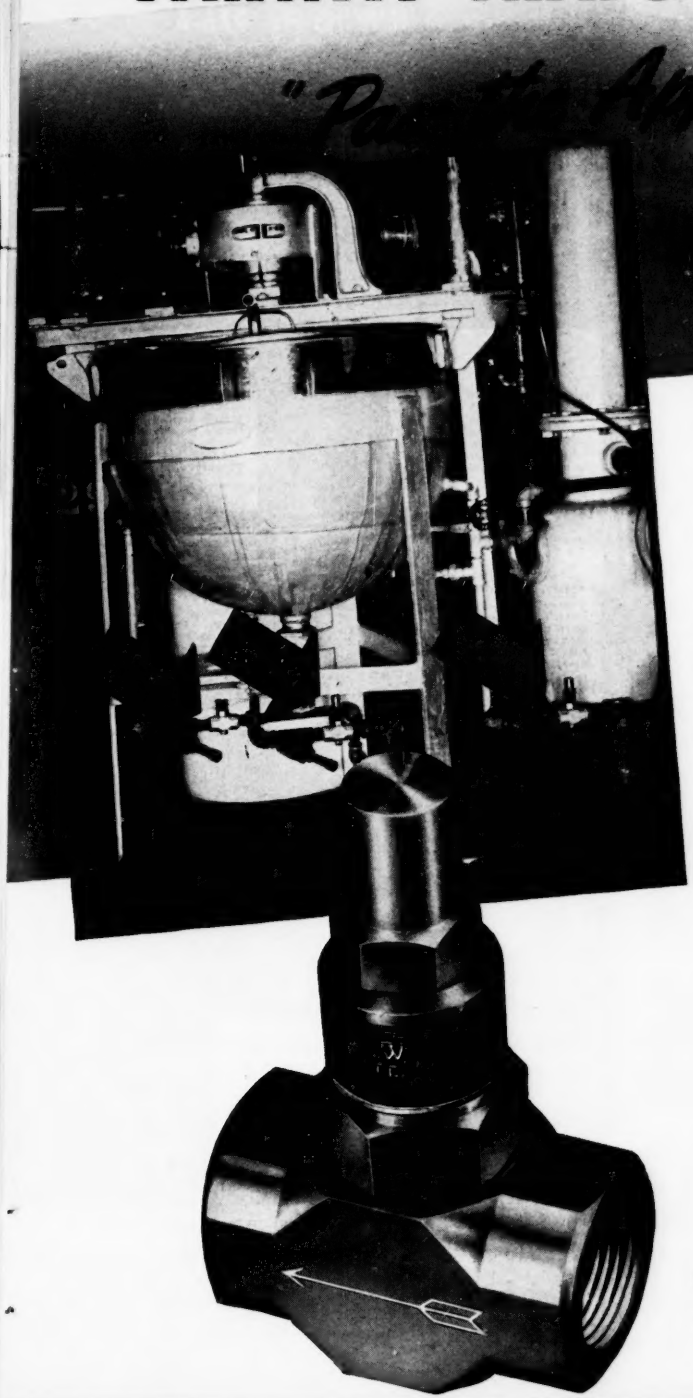
turns out double-wall trays or cartons, telescope-type boxes automatically. Further information on this or other units in the General Mills line of packaging machinery (ice cream carton set-up and closing machines, Vacuflow powder fillers) is yours for the asking. Address Dept. F39, General Mills, Inc., 1620 Central Ave., Minneapolis 13, Minnesota.

General Mills Tray-Lock Machine

Mechanical Division
General Mills, Inc.
Packaging Machinery

Made by one of the world's largest users of packaging machinery

YARWAY TRAPS HELP "Pa[illegible] Apple Butter" FASTER!



Three little Yarway Impulse Steam Traps do a big job on this steam jacketed kettle, shortening cooking time in the production of apple butter and other fruit products.

The scene is a pilot plant operation at the Eastern Regional Research Laboratory of the Department of Agriculture . . . but the results are the same wherever steam equipment is used. From all corners of the country comes the report—*Yarways get steam equipment hotter, sooner and keep it hot!*

That's because Yarway Impulse Traps discharge *continuously* under heavy loads, while equipment is being brought to operating temperature. Then, under lighter loads, they discharge at short intervals, maintaining peak efficiency.

Other important Yarway advantages are small size, easy maintenance (only one moving part), broad pressure range and low cost.

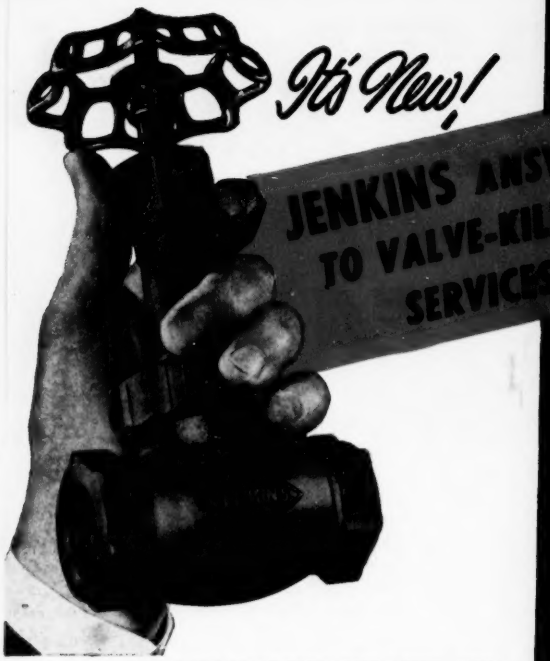
Try a Yarway today . . . standardize on Yarways tomorrow. See your nearest Mill Supply dealer, or write for Yarway Bulletin T-1739.

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

Yarway Traps are made and sold in Canada and Great Britain

OVER 600,000 ALREADY PURCHASED!

YARWAY IMPULSE STEAM TRAP



JENKINS Fig. 976-A

PLUG TYPE

BRONZE GLOBE VALVE

NEW "TUFFARD" SPINDLE

Aluminum bronze of tensile strength exceeding 65,000 lbs.—tough to take stresses, *hard* for long wear. Bigger in diameter—more strong threads.

MORE THREADS, LESS WEAR

Additional threads in bonnet and on spindle assure full thread engagement—open or closed—less load, less wear per thread.

NEW SLIP-ON, STAY-ON PLUG

Simple design with T-slot for engaging spindle head is stronger, trouble-free, permits free flow. Mirror-finished bevel assures perfect mating with seat ring.

NEW STURDY LUGS

Flat-faced, V-shaped lugs on union bonnet ring and body ends permit firm fit and grip of open end, pipe, or monkey wrench, —withstand repeated disassembly.

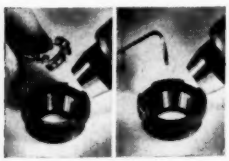
500 BRINELL ARMOR SEAT DEFEATS TOUGHEST VALVE ENEMIES

Plug and Seat Ring of Jenkins JX500 special alloy stainless steel—heat treated to 500 Brinell hardness and extra-ordinary ductility—lapped together to a mirror finish. Unaffected by throttled steam, resists galling, erosion, corrosion.

300 lbs. Steam 600 lbs. O.W.G.

BUILT TO BREAK RECORDS FOR LONG LIFE

Now, for the most severe services, you can choose the new Jenkins Fig. 976-A with complete confidence that it will set new economy records. Use it for pressure regulation, bleeds, drips, and drains, or any close regulation of steam that threatens wire drawing. It will lower maintenance, last longer, where entrapped pipe chips, scale, or rust tubercles are a problem.



SMASHED PIPE CHIPS, WIRE, LEAVE NO SCARS

Steel pipe chips and 1/16" wire rod, with Brinell hardness in excess of 300, were crushed between the new Jenkins JX500 Plug and Seat Ring without leaving a scratch or dent. That's proof of super hardness!

Compare Fig. 976-A, part for part, and see why it's as nearly wear-proof, trouble-proof, and maintenance-free as any stock valve can be. Only a few of the dozen ways it's better are shown here. Get the complete story in the new folder. See why it's unrivalled for endurance and economy, —why it's your best buy in plug-type valves! Use coupon.

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

LOOK FOR THIS TRADE JENKINS MARK DIAMOND MARK

SINCE Jenkins Bros. 1864

JENKINS VALVES

Types, Sizes, Pressures Metals for Every Need

GET COMPLETE DETAILS—IN THIS NEW FOLDER

Mail Coupon Today!

JENKINS BROS., 80 WHITE ST., NEW YORK 13

Please send Armor Seat Valve folder—Form 193

Name .....

Company .....

Address .....

How to be famous for dandy candy

Always keep NORDA PINEAPPLE handy

You can use more customers, can't you? Team up with Norda and get them.

Depend on Norda Pineapple to make all your pineapple-flavored products more popular than ever. Give your mixes, gelatins, hard candies, and other favorites more *real pineapple* appeal.

People like Norda's true pineapple taste. To prove that preference, look at the industry leaders whom Norda has served for years.

Improve your products with Norda Pineapple Flavor. Try it by sending today for Free Samples. Free Catalogue, too. Write now.

Another "Favorite to Flavor It"— from Norda

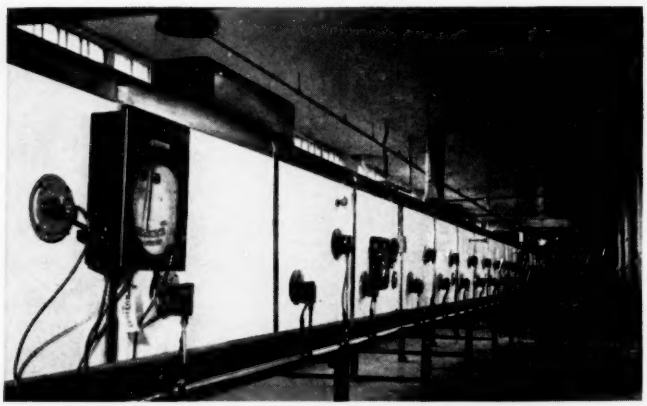
Norda ESSENTIAL OIL AND CHEMICAL COMPANY, INC.

601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • ST. PAUL • MONTREAL • TORONTO • HAVANA • MEXICO CITY • LONDON • PARIS

☆ IN PACE WITH ADVANCEMENTS IN FOOD PLANT ENGINEERING ☆

"Excellent Control" SAY GRIGGS-COOPER ENGINEERS . . . with Brown Thermometers on this new Greer Band Oven



GRIGGS-COOPER COMPANY, St. Paul bakers, are more than pleased with initial results from their new Greer gas-fired Band Oven. Although still in the pilot plant stage, they are getting "excellent control" with Brown Thermometers. Exact baking cycles are maintained . . . product quality and uniformity are exceptionally high . . . new economies are sure to follow.

Precise control rests with the oven design . . . this Greer Oven is ideally suited in size, shape and type of firing to the use of thermometers. Six Brown Thermometers operating Honeywell *Gradutrol* valves in the fuel line accurately measure, indicate and pneumatically control zone temperatures.

This "excellent control" can be yours, too! Whether you bake cookies, crackers, cakes or pretzels . . . Brown specializes in the automatic, precision temperature control that you need.

Write today for your copy of Catalog 6708, for detailed information on Brown Indicating, Recording and Controlling Thermometers.

MINNEAPOLIS-HONEYWELL REGULATOR CO.
BROWN INSTRUMENTS DIVISION
4502 Wayne Ave., Philadelphia 44, Pa.
Offices in principal cities of the United States, Canada and throughout the world

BROWN *Advanced Instrumentation* FOR THE FOOD INDUSTRY
Product of MINNEAPOLIS Honeywell

For power modernization...

MEET PRODUCTION "VARIABLES"

Fingertip speed control provides positive power at the correct production speed – faster or slower. Improved Sterling Speed-Trol gives you infinite speed control in a single, rugged, dependable power unit occupying one half the space formerly required – fits standardized motor mounting – incorporates V-Belt and proven engineering principles.

Improved STERLING
SPEED-TROL

SEND FOR NEW INFORMATIVE LITERATURE

USE GEARED CONSTANT SPEED

There is no other known method of obtaining constant slow speed that is more efficient or economical in operation than this improved Sterling Slo-Speed motor. Sterling Slo-Speed motors with gears, motor and all parts, Sterling made into one rugged, compact unit, will give you long, dependable service at the "one best" constant production speed.

Improved STERLING
SLO-SPEED

SEND FOR NEW INFORMATIVE LITERATURE

NORMAL SPEEDS . . . Use the improved Sterling Klosd general-purpose motor — where one best constant normal speed is required.

Thousands of satisfied, world-wide users are increasing plant profits with Sterling Speed-Trol and Sterling Slo-Speed motors.

STERLING ELECTRIC MOTORS

GENERAL OFFICES: LOS ANGELES 22, CALIFORNIA

New York 7 • Chicago 6 • Detroit 2 • San Francisco 5 • Philadelphia 7 • Boston 9
Seattle 4 • Cleveland 15 • Pittsburgh • Cincinnati 2 • Atlanta 3 • St. Louis 8 • Houston
Milwaukee 2 • Memphis • Kansas City 2 • Minneapolis 15

Canadian Sterling Electric, Ltd., Hamilton, Ontario, Canada
Representatives in Principal Cities and Foreign Countries

The SCOTT NET WEIGHER

The original --and still the best!

The Scott Scale forms the basis of a family tree of net weighing and filling machines, both semi-automatic and fully automatic. The basic Scale alone (made in four different size models) is used for packaging free running items such as ground coffee, bean coffee, rice, barley, etc. To the Scale unit can be added one of our several models of Power Feeders, permitting the handling of a multitude of semi free flowing products such as Silex coffee, tea, nuts, candy, fine corn meal, lima beans, dog food, cut macaroni, cracker crumbs, etc. On a single dump unit, these products can be filled with closest accuracy at speeds up to 35/40 weighings per minute.

The semi-automatic Scale and Feeder unit becomes fully automatic in the Straight Line Weigher, and in our large Rotary Net Weighing Machines (the Models TU and TU-K), where single or duplex Scott Scale units form the basis of fast and accurate automatic weighing and filling.

Close to fifty years ago, the Scott Weigher was first manufactured by National Packaging Machinery Company, the original and only machine of its kind at that time, for continuous dump weighing and filling of coffee, tea, peas, beans and other food items. Today, under U. S. Automatic ownership, it is still made by the same company, by the same skilled craftsmen as in its early days. It is built to precision standards akin to watchmaking in their painstaking craftsmanship . . . the Scott has never sacrificed its fine workmanship to "corner cutting" production methods. To this we attribute the fact that the Scott today is the *fastest and most accurate single dump weigher in existence.*

Even now, we receive for overhauling Scott Weighers that were built 40 years ago, and which, when reconditioned and returned to the customers, operate like new.

The Scott Weigher has, of course, seen many changes with the years. It has been simplified and improved and its tripping mechanism is now solenoid actuated, which contribute to give it a smooth action with resulting speed and accuracy unequaled in the field.

Perhaps you'd like more information on what the Scott Weigher can do for your particular packaging needs. Won't you send us particulars on the types of products and containers you want to run, and the weight range and speed you require?

US

NET & GROSS WEIGHING ★ PACKAGE FORMING & FILLING ★ CARTON SEALING, LINING, WRAPPING ★ BOX MAKING

AUTOMATIC BOX MACHINERY CO., INC.

Owning and Operating NATIONAL PACKAGING MACHINERY CO. ★ CARTONING MACHINERY CORP.

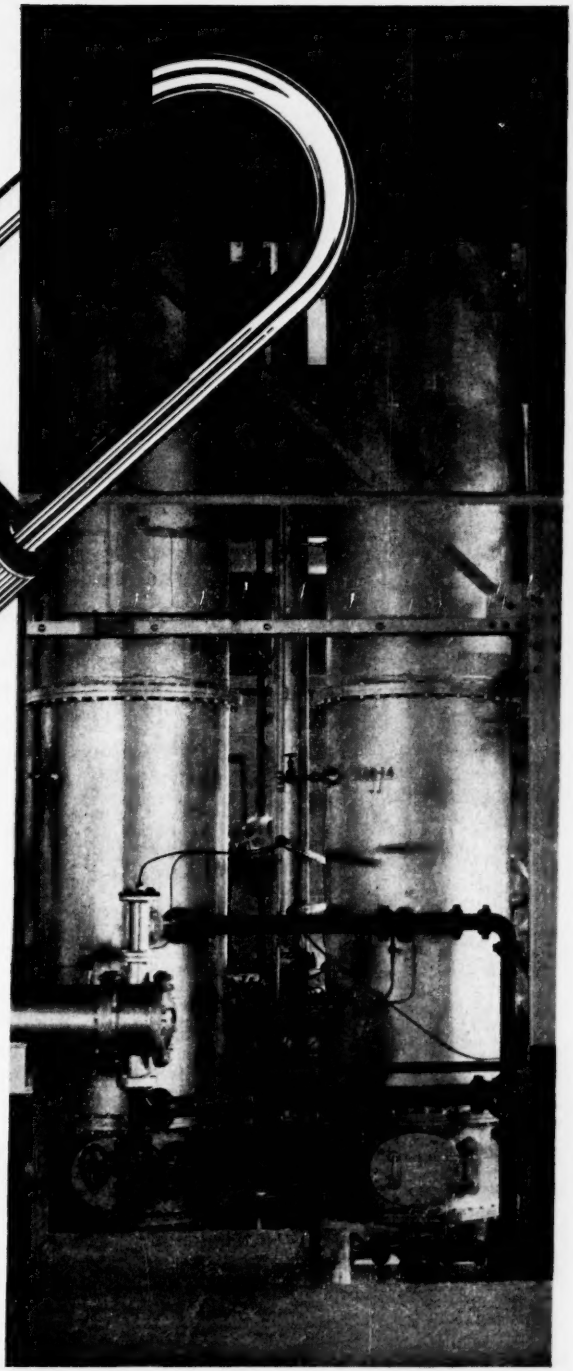
69 ARBORETUM ROAD, ROSLINDALE, BOSTON 31, MASS.

Branch Offices: New York ★ Cleveland ★ Chicago ★ Los Angeles (Krugh Equipment & Supply Co.)

BUFLOVAK LOW-TEMPERATURE EVAPORATORS

safeguard...

THE GOOD QUALITIES OF YOUR CONCENTRATED PRODUCT!



BUFLOVAK'S Low-Temperature Evaporators protect the quality of the most delicate materials . . . thus offering safe treatment for any Food products or Chemicals.

These new BUFLOVAK Evaporators operate at extremely low temperatures and pressures. You are assured of dependable operations, day after day, with long operating periods. Automatic controls simplify operation, save labor, and give uniform results, even to the density of the product.

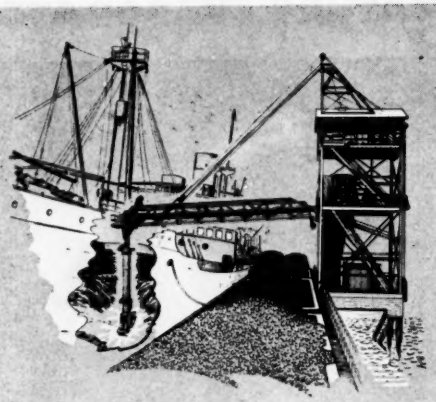
Added profits from BUFLOVAK equipment result from uniform, high product quality at low production cost. And, BUFLOVAK Low-Temperature Evaporators are sold outright with *protective performance guarantees!*

Other BUFLOVAK Equipment for processing Chemicals and Foods include DRYERS, SOLVENT RECOVERY and PROCESSING EQUIPMENT. Send for Bulletin No. 342.

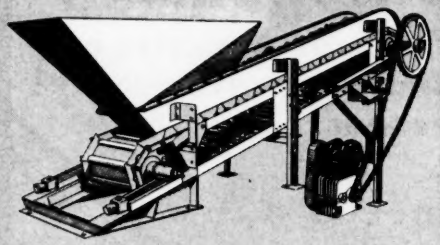
BUFLOVAK EQUIPMENT

Division of Blaw-Knox Co.

1551 FILLMORE AVE. BUFFALO 11, N. Y.



S-A centrifugal action boat trimmer for loading and trimming bulk materials into holds of ships.



S-A pan conveyor for feeding bulk materials.

Stephens-Adamson Engineers are Qualified to

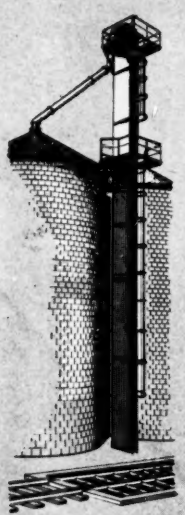
SURVEY Your SYSTEM

for Handling Bulk Materials

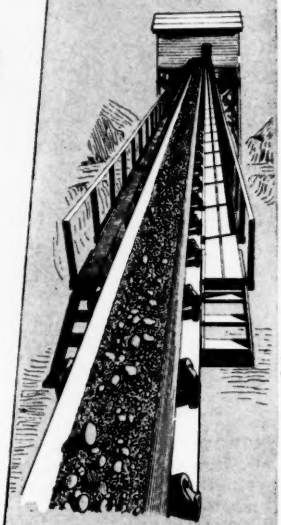
We offer a check-up by our well-qualified staff of specialists in handling bulk materials—from lumps to powder.

The reasons for such a survey are *improvement* of product, and saving in handling cost. The recommendations you receive will be based on 50 years of installing successful conveying systems. Since we make *every* type of conveyor, we can propose without prejudice the best type for your job.

Write us to check whether your present conveyor system is right, or could be materially improved.



S-A bucket elevator storing bulk materials in two silos.



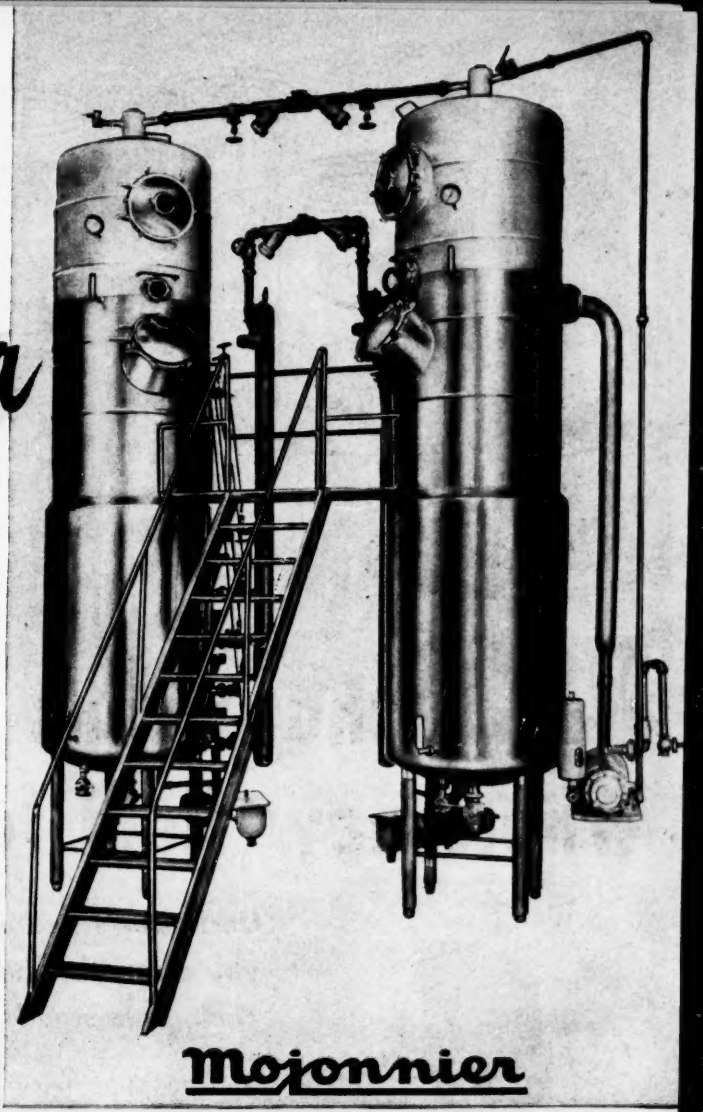
S-A belt conveyor with roller bearing equipped carriers.

STEPHENS-ADAMSON

6 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. • BELLEVILLE, ONT.

Designers and Manufacturers of All Types of

Twins for California



You're looking at a new coupled installation—a Mojonnier Twin Fruit Spread Cooker, recently installed in a California plant producing a popular grape juice. The double design allows one batch to be removed while the other is cooking so that a continuous flow of production is maintained.

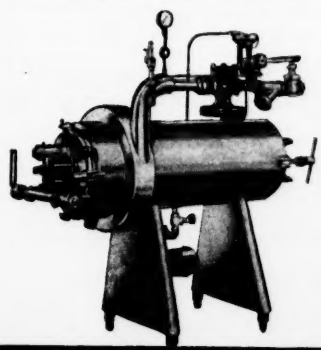
FRUIT SPREAD COOKER FEATURES:

- Rapid evaporation at low temperatures.
- Coil-free interior—heating surface in side wall.
- Coil-wall construction maintains maximum efficiency.
- Side condenser permits installation in low ceiling plants.
- Retains natural product flavor.
- Condenser designed for low water consumption.
- Completely packaged unit, ready for immediate operation.
- All-welded stainless steel sanitary construction—easy to clean.
- Simplified, economical operation—streamlined design.
- Backed by years of successful evaporator installations in food plants all over the world.

MOJONNIER BROS. CO., 4601 W. Ohio St., Chicago 44, Ill.

Mojonnier

FRUIT SPREAD COOKERS



MOJONNIER
TUBULAR HEAT EXCHANGERS

Featuring: Instant heating to above 200° F. with exact temperature control • Quick, easy cleaning—only two doors, two gaskets • Simplified controls—streamlined design • Automatic desuperheating insured by tangential steam entry • Air continuously and automatically removed • All parts in contact with product are of stainless steel • Continuous condensate removal • Custom-engineered for each particular application • Backed by years of heating engineering experience • Compact, packaged unit, ready for immediate installation • Minimum floor space required • Furnished in 23 models; wide range of sizes and capacities • Available in 5-ft., 10-ft. lengths, twin, one above the other to fit any space.

For descriptive circular on Fruit Spread Cookers mention Bulletin No. 154. For full information on Tubular Heat Exchangers mention Bulletin No. 164.

Other Mojonnier Engineered Equipment serving Food Processors:

- **COMPACT COOLERS** *(Senior, Junior models)*
- **COLD-WALL TANKS** *(Also Plain, Storage)*
- **CONVEYORS** *(Bottle, Case, Can)*
- **VACUUM FILLERS**

RICE that opens up a whole new field for canners

Uncle Ben's CONVERTED LONG GRAIN RICE

Uncle Ben's exclusive process brings you a rice that never cans mushy. Each grain stands apart!

Now for the first time you can turn out such profitable specialties as those shown above—thanks to an exclusive new process that makes Uncle Ben's *Converted* Rice perfect for canning.

It's rice with the gamble taken out! Each grain stands apart under processing and steriiizing temperatures. Never goes mushy or gummy. By itself, or in combination with other foods, it looks the way rice should look—tastes the way rice should taste.

Uncle Ben's *Converted* Rice never varies in canning qualities from pound to pound or bag to bag. It is always clean and ready to use. Always cooks the same—at the same temperature, in the same length of time. Your canning procedures need never change.

Write for Samples

If you now use rice as an ingredient, or have new products in mind, send for samples of Uncle Ben's Rice. Put it through your own tests. Write for further information.

EACH GRAIN SALUTES YOU

CONVERTED RICE, INC., Houston, Texas

ALCOA PACKAGING REPORT NO. 49-1

25-day, high-temp. test proves foil-wrapped candy best in flavor, weight, appearance

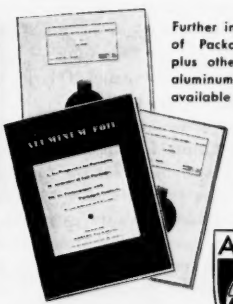
Less weight loss—Weight loss of a 1-lb. bar of chocolate pecan fudge wrapped in conventional double-wrap paper — 11.0 grams. Weight loss wrapped in wax paper with overwrap of .0004" aluminum foil mounted to wax paper—2.5 grams. Weight loss wrapped in .001" aluminum foil alone —1.5 grams.

Object of lab test: To determine what taste and weight changes develop in chocolate pecan fudge bars when packaged in laminated aluminum foil wrappers vs. conventional double-wrap paper wrappers. Storage temperature—85° F. to 90° F. Length of time—25 days.

Conclusions: Aluminum foil, with its moisture-vapor transmission rate of practically zero, gives definitely better protection in preserving the freshness, flavor and appearance of the candy (see below). For further information about Alcoa Aluminum Foil, write ALUMINUM COMPANY OF AMERICA, 1845 Gulf Building, Pittsburgh 19, Pennsylvania.

Better flavor—By a control system of taste-checking, foil-wrapped candy was judged superior to the conventional double-wrap, paper-wrapped candy.

Better appearance—Candy wrapped in Alcoa Foil retained soft, creamy texture. That wrapped in paper presented a hard, dry surface with crystallization along the edges.

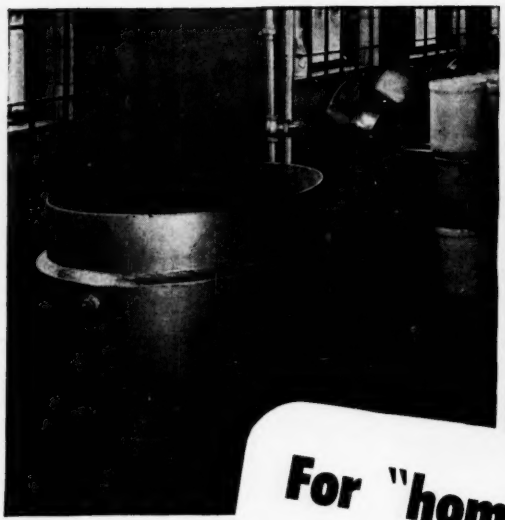


Further information on the results of Packaging Laboratory tests, plus other facts and figures on aluminum foil for packaging, are available upon request.

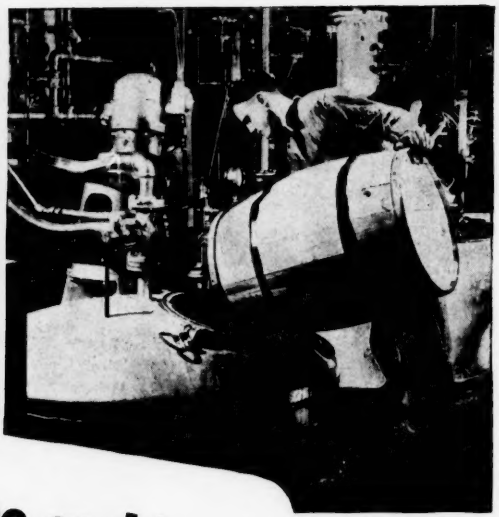
ALCOA

ALCOA ALUMINUM FOIL

THE QUALITY PACKAGING MATERIAL FOR QUALITY PRODUCTS



This steam-jacketed cooking kettle is made of Lukens 20% Nickel-Clad Steel.



Like the smaller kettle, this high-pressure autoclave is made of Lukens Nickel-Clad Steel.

For "home cooking" or big business, use LUKENS CLAD STEELS

Whether you're processing foodstuffs in small kettles or giant autoclaves, Lukens Clad Steels give you these same advantages—no metallic contamination, preservation of clarity and color, and long life for the equipment.

Lukens supplies Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels to manufacturers of equipment for the food processing industry. Thus they are able to combine the corrosion-resistant advantages of *solid* nickel, stainless steel, Inconel and Monel with those of *clad* steels—lower first cost and superior heat transfer properties, for example.

Ask your supplier about equipment made of Lukens Clad Steels, in which uniform claddings of the corrosion-resistant metals, 10% or 20% of total plate thickness, are permanently bonded to mild steel backing plates. You'll like the smooth, easier-to-clean surfaces now provided by the sodium hydride finish.

For additional data on Lukens Clad Steels, write for Bulletins 255 and 338. Lukens Steel Company, 401 Lukens Building, Coatesville, Pennsylvania.

LUKENS
Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

Two 16mm Kodachrome motion pictures—"The Manufacture of Lukens Clad Steels" (silent) and "Solving Corrosion Problems" (with sound)—will be loaned to you. Write for booking date.

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

★ EASY TO FILL

★ COMPACT

★ FIRE-RESISTANT

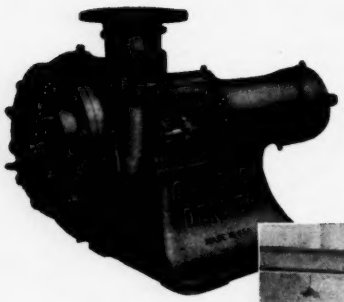
★ LIGHT WEIGHT

★ EYE-APPEALING

★ TAMPER PROOF

No other container protects like the can

CAN MANUFACTURERS INSTITUTE, INC.



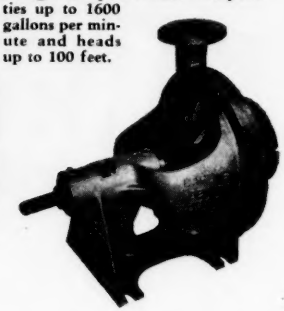
FOR HANDLING FLUIDS CONTAINING SOLIDS up to 6 inches in diameter, Gardner-Denver Sewage and Waste Disposal Pumps are built in capacities from 50 to 5000 gallons per minute.

RUGGEDLY CONSTRUCTED FOR LARGE CAPACITY Gardner-Denver Horizontally Split Case Double Suction Centrifugals are available in sizes for all heads up to 300 feet.

Gardner-Denver's modern hydraulic testing laboratory, showing centrifugal pump direct connected to Dynamometer for efficiency test.

COMPACT Gardner-Denver Close-Coupled Centrifugal Pumps may be installed in any horizontal or vertical position—are designed for capacities up to 250 gallons per minute and heads up to 250 feet.

FOR GENERAL UTILITY SERVICE Gardner-Denver Side-Suction Centrifugal Pumps are made in capacities up to 1600 gallons per minute and heads up to 100 feet.



Fully Tested
For
Full-Value Efficiency
Gardner-Denver
Centrifugal Pumps

Since 1859

You can be sure of getting *full-value* efficiency on every one of your pumping jobs when you insist on Gardner-Denver *fully tested* Centrifugal Pumps. For every Gardner-Denver pump you buy has already proved its dependability and power economy—through thorough and accurate testing in our modern hydraulic laboratory, completely equipped with the best and most accurate testing equipment available. It's no wonder these popular pumps so easily attain and often exceed their rated efficiencies in hundreds of different kinds of pumping installations.

For expert advice on selecting just the right Gardner-Denver Centrifugal for any installation, or for further information on any of the pumps described here, write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER

Mundet Corkboard is a Money-Saving HEAT & MOISTURE BARRIER

Perishables in this cold storage room are protected by Mundet Corkboard in floors, walls and ceiling. Inset shows Corkboard being installed in ceiling of freezer. All joints are vapor-sealed.

Mundet Corkboard is a time-proved heat and moisture barrier . . . serving at top-efficiency in hundreds of quick freezing and frozen food locker plants, in cold storage rooms and food processing plants. Whether you have small or large facilities for low temperature, you need Mundet Corkboard for these dollar-saving advantages:

LOW CONDUCTIVITY Mundet Corkboard provides the most efficient barrier to heat transfer due to its internal cellular structure of sealed dead-air spaces.

STRUCTURAL STABILITY The cellular structure of Mundet Corkboard maintains its shape and characteristics under rigorous conditions of service.

NON-ABSORBENCE Mundet Corkboard has no capillary attraction. This nature-made quality avoids absorption of dampness and odors. There is no swelling or loss of insulating value from moisture infiltration.

EASE OF INSTALLATION Mundet Corkboard is light in weight despite its strength. It cuts easily, readily holds nails or skewers; bonds with cement, asphalt or paint.

LONG-LIFE There is only one way to figure insulation cost. That is the over-all 'life-expectancy' of the material. Here, again, Corkboard is the choice, with thousands of installations to prove its durable service.

The best insulation requires competent installation. You benefit from the experienced erecting services that are offered by Mundet branch offices. Corkboard is available for prompt shipment from nearby warehouses. Send coupon for copy of Mundet Cork Manual. Prepared in convenient filing size, with cork specification data.

MUNDET CORK CORPORATION
Insulation Division
7101 Tonnelle Ave., North Bergen, N. J.

Please send copy of Mundet Cork Insulation Catalog in handy reference size.

Name .....

Company .....

Address .....

City ..... *Zone* ..... *State* ..... F 13

Mundet district offices are located in these cities:

ATLANTA
339-41 Elizabeth Street, N.E.

BOSTON
57 Regent St., North Cambridge 40

CHARLOTTE, N. C.
206 E. Stonewall St.

CHICAGO 16
2601 Cottage Grove Avenue

CINCINNATI 2
427 West 4th Street

DALLAS 1
601 Second Ave.

DETROIT 21
14401 Prairie Street

HOUSTON 1
Commerce and Palmer Streets

INDIANAPOLIS
15 E. Washington St.

JACKSONVILLE 6, FLA.
800 E. Bay St.

KANSAS CITY 7, MO.
1428 St. Louis Avenue

LOS ANGELES
(Maywood)
6116 Walker Avenue

NEW ORLEANS 16
315-25 N. Front Street

PHILADELPHIA 39
856 N. 48th Street

ST. LOUIS 4
2415 South Third Street

SAN FRANCISCO 7
440 Brannan Street

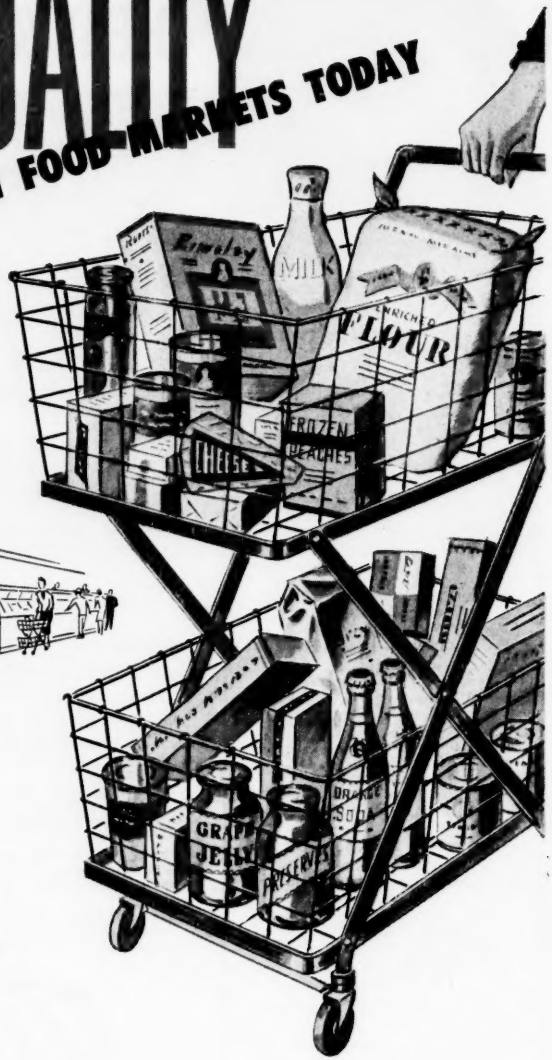
In Canada:
Mundet Cork & Insulation, Ltd.
35 Booth Avenue, Toronto

Write us for name of our nearest representative if there is no Mundet office in your city.

MUNDET
CORK INSULATION

SUPER QUALITY

KEEPS ON ROLLING IN FOOD MARKETS TODAY



Food manufacturers today offer super quality. They also offer super value nutritionally. And just one order in a single market may offer

many examples of both — products to which Chas. Pfizer & Co., Inc., has made important contributions.

When it comes to quality, the Pfizer seal means just what it implies — rigid control. This is equally true in an Enrichment Concentrate supplied to millers for fortifying flour for home use . . . in Tartaric Acid and Citric Acid provided as acidulants for makers of jams and jellies and beverages . . . in Citric Acid, Tartaric Acid, Cream of Tartar and Sodium Citrate providing desirable taste characteristics to confections.

And to keep the orchard-fresh flavor and color of frozen fruits, commercial processors use Pfizer Ascorbic-Citric Acid mixtures to stop browning and deterioration. For detailed information, including prices on every product mentioned, write to Chas. Pfizer & Co., Inc., 81 Maiden Lane, New York 7, N. Y.; 211 E. North Water Street, Chicago 11, Illinois; 605 Third Street, San Francisco 7, Calif.

PFIZER QUALITY ®

PFIZER

Manufacturing Chemists Since 1849

JAMISON-BUILT

COOLER and FREEZER DOORS

to meet every need

WALK-IN DOOR

DOUBLE DOOR

REACH-IN DOOR

TRACK DOOR

VESTIBULE DOOR

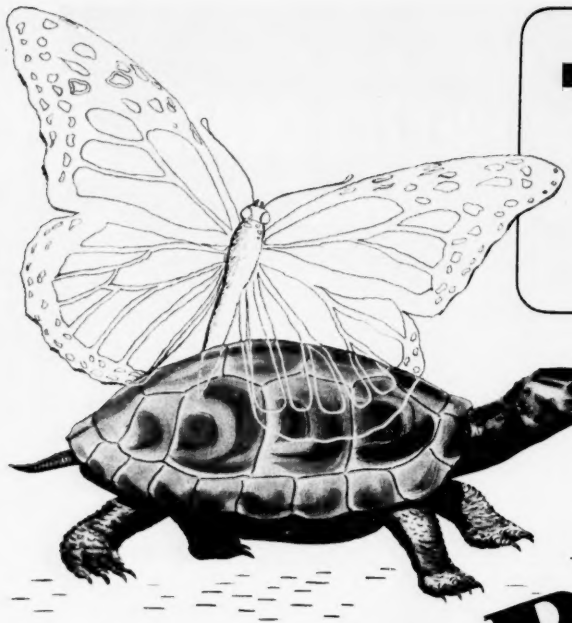
The doors illustrated are some examples of Jamison-Built Standard Cooler and Freezer Doors for moderately low temperatures, including exclusively Jamison features. All are infitting doors with Cooler-seal gaskets and Jamison hardware—the Wedge-tight Fastener and Adjustoflex Spring Hinge.

Standard models of Jamison-Built Doors are available in a wide range of sizes. Should you require special types or sizes, we can build them to any specification. Our new condensed catalog, No. 175, packed with helpful information on cold storage doors is now available. Send for your copy today.

JAMISON COLD STORAGE DOOR CO.
HAGERSTOWN, MD.

The Oldest and Largest Builder of Cold Storage Doors in the World

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.



PROTECTION AND Beauty

KVP PAPERS For The FOOD INDUSTRY

The No. 1 requirement of any food paper is protection. It must keep its contents fresh until ready for use.

It can also be beautiful, for quick sales appeal.

Look to KVP papermakers, artists and printers for the last word in protection and beauty.

INDUSTRIES SERVED

BAKING
Bread - Cracker
Cereal

MEAT
Packing - Locker
Retail

DAIRY
Butter - Cream - Cheese
Ice Cream - Milk

FISH - FRUIT - FROZEN FOODS
POULTRY - SHORTENING
VEGETABLE

* The giant tortoise from the Galapagos Islands owes his long life to the protection of his great horny shell.

** This beautiful butterfly, Anosia-Plexippus, is a native of North America.

Kalamazoo Vegetable Parchment Company

PARCHMENT · MICHIGAN

ASSOCIATED COMPANIES: KALAMAZOO VEGETABLE PARCHMENT CO., DEVON, PENNA.
KVP COMPANY OF TEXAS, HOUSTON, TEXAS
HARVEY PAPER PRODUCTS CO., STURGIS, MICHIGAN
IN CANADA: THE KVP COMPANY LIMITED, ESPANOLA, ONTARIO
APPLEFORD PAPER PRODUCTS LIMITED, HAMILTON, ONTARIO - MONTREAL, QUEBEC

Simple as pinching a rubber tube

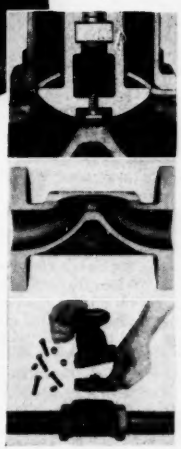
A GRINNELL-SAUNDERS DIAPHRAGM VALVE works on a simple principle . . . it pinches tight for positive closure and opens wide for streamlined flow. The working parts of the valve are completely isolated from the fluid . . . no corrosion, no contamination and no leaks. Choice of diaphragm material. Body materials . . . cast iron, malleable iron, bronze, aluminum, stainless steel. Body linings . . . glass, lead, rubber or synthetics.

NO METAL-TO-METAL SEAT . . . The large contact area on which this flexible diaphragm seats gives positive closure even when grit, scale or other solid matter is temporarily trapped.

MINIMUM RESISTANCE TO FLOW . . . Smooth streamlined fluid passage without pockets prevents accumulation of sludge and reduces friction resistance to a minimum.

MAINTENANCE REDUCED . . . The diaphragm is the only part that normally wears out. Replaced in a few minutes without removing valve from line.

Available in various combinations of valve bodies and operating mechanisms.



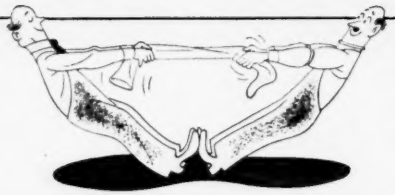
99 YEARS PIPING

GRINNELL

Grinnell Company, Inc., Providence 1, Rhode Island. Branches: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston Long Beach • Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

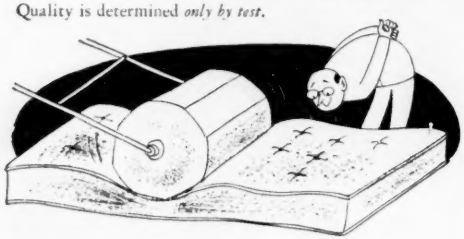
These are "Trying" Times

—be sure to try it before you buy it!



The Pull-the-Leg Test. You should see what a woman's stocking goes through before it reaches a leg. Wow! Snagging tests, abrasion tests, flexing tests, bursting tests, dye and fiber tests. But after all, it makes sense. Quality is determined *only by test.*

The Lye Test. Don't let anyone "pull the wool" over your eyes. If you want to make sure a fabric is all wool, simply boil a small piece of it for about fifteen minutes in a solution of lye and water. If the fabric dissolves completely . . . well, it *was* all wool.



The Sleep-Like-a-Log Test. They use a mechanical Rip Van Winkle to test the quality of a mattress. Back and forth, back and forth a heavy eight-sided roller passes over the mattress. If the mattress can stand up under 400,000 passes, you can be sure it's one of the best.

The Square Foot Test

One of the surest tests to find the best *and most economical* brand of paint to use in your plant is the *square foot test.* Take a gallon of any good paint and a gallon of Barreled Sunlight. Thin each according to directions on the cans. Then measure the number of square feet each paint covers on a wall. And, because labor represents about 80% of the cost of any painting job, check the length of time it takes to apply each paint. Notice the difference in their whiteness and hiding power after drying overnight.

Yes, compare any good paint with Barreled Sunlight. You'll see that *Barreled Sunlight will do a better-looking, longer-lasting job at lower cost for both paint AND LABOR than any other paint on the market.*

See for yourself. Let your nearest Barreled Sunlight representative give you a convincing demonstration. Write.

U. S. GUTTA PERCHA PAINT COMPANY
37-C Dudley St., Providence, R. I.

Barreled Sunlight *Paints*

In whitest white or clean, clear, pleasing colors, there's a Barreled Sunlight Paint for every job

CORROSION COSTS $6,000,000,000.00 ANNUALLY!

No industry escapes... how much do you pay?

Save needless waste

In one form or another acids, alkalis, salts, gases and atmospheric conditions cause corrosion damage. In every industry losses are prevalent – losses in time, materials and equipment, much of which could have been avoided. Minimize your risk – do these two things now –

1 – Check up on your costs;

2 – Provide adequate protection for danger points.

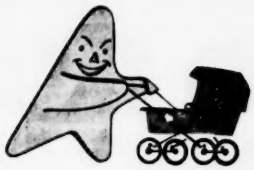
Experienced and competent Amercoat engineers are available to help you on both. They'll check up on your costs, which may be greater than you know because the effects of corrosion are often hidden. They'll report on conditions as they find them. They'll recommend steps to take if greater protection can be provided and money saved. Inquiries from interested executives will receive prompt attention. There's no obligation – write today.

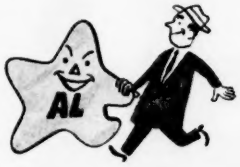
AMERCOAT DIVISION
AMERICAN PIPE AND CONSTRUCTION CO.
Dept. 10, 4809 Firestone Blvd., South Gate, Calif.

EXAMPLE OF NEEDLESS LOSS – This 6" valve has been exposed to atmospheric conditions, near the seacoast. Improperly coated, it was ruined in a short time.

FOLLOW THE LINE OF *most* RESISTANCE

A SYSTEM OF SURFACE PROTECTION

How long 

is a lifetime 

in Stainless Steel?

We call Allegheny Metal "the time-tested stainless steel" because it's the pioneer in America, but time hasn't really tested it yet. Neither we nor anyone else knows how long stainless steel will last. The earliest installations of Allegheny Metal—made more than 20 years ago—are just as bright, strong and resistant as when new. How can you defeat a metal that doesn't wear out and can't wear off? • More important, how and where can you *use* it to advantage, *today?*

W&D 2175

Complete technical and fabricating data—engineering help, too—yours for the asking.

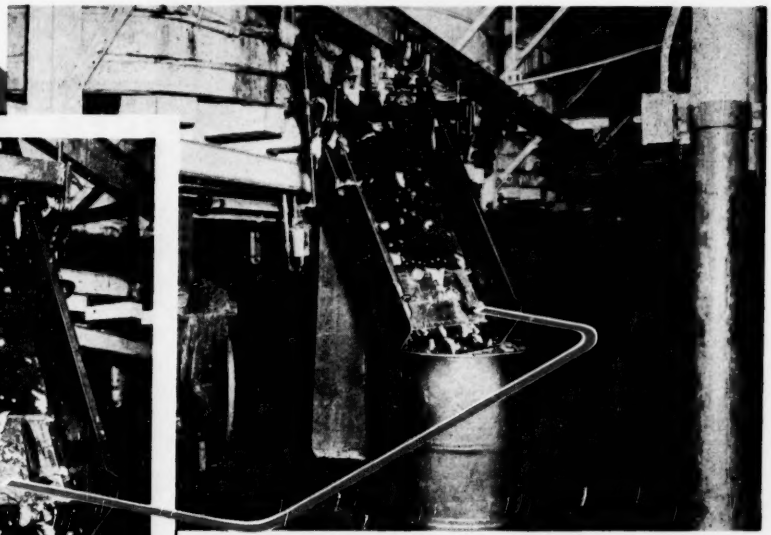
ALLEGHENY LUDLUM STEEL CORPORATION

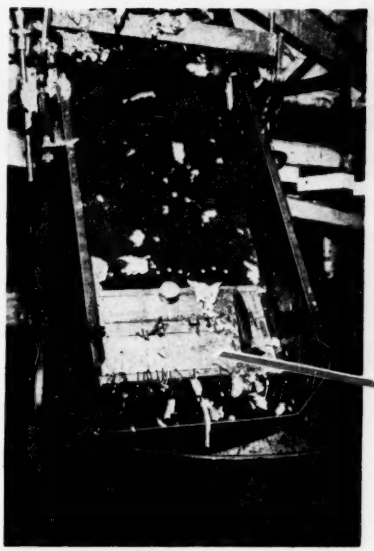
The Nation's Leading Producer of Stainless Steel in All Forms

Pittsburgh, Penna. . . . Offices in Principal Cities

Allegheny Metal is stocked by all Jos. T. Ryerson & Son, Inc., Warehouses

Vital Magnetic Protection... at WILSON PACKING CO.

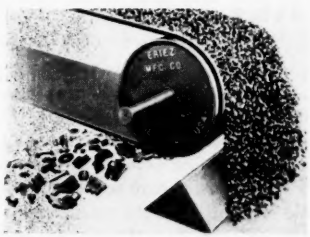




Eriez Non-Electric Permanent Magnets protect meat packer's products

TRAMP IRON cannot menace machines nor contaminate the products of the Wilson Packing Company. Their plants over the country utilize both Eriez Permanent Non-Electric Magnetic Pulleys and Plates to provide essential protection from tramp iron and assure purity of product. For example, United Chemical & Organic Products Division of Wilson & Company utilize Eriez Giant Magnets to remove tramp iron from the residue of their gelatine processing lines at their Calumet City, Illinois, plant. Machines used for subsequent processing of this residue are thereby protected. Notice the accumulation of tramp iron stopped by this unit. Engineered to fit the job of ferrous metal separation at hand, Eriez builds magnets in a variety of sizes and strength to meet each and every application. The intense penetrating magnetic power of Eriez Magnets prevents machinery damage, accidents to personnel, and assures purity of product throughout industry at a minimum of cost.

Furthermore, Eriez Magnetic Protection can be installed and forgotten on the cost sheet. No electrical equipment is needed, no current, no costly maintenance of switches, coils, rectifiers—First Cost is Last Cost. Eriez Magnets are Permanent in Penetrating Power. From the complete Eriez Line You Get the Correct Magnet for the Job.



Wilsons' also use Eriez Pulleys to protect fat expellers from damage.

Pioneer of PERMANENT Magnetic Separation

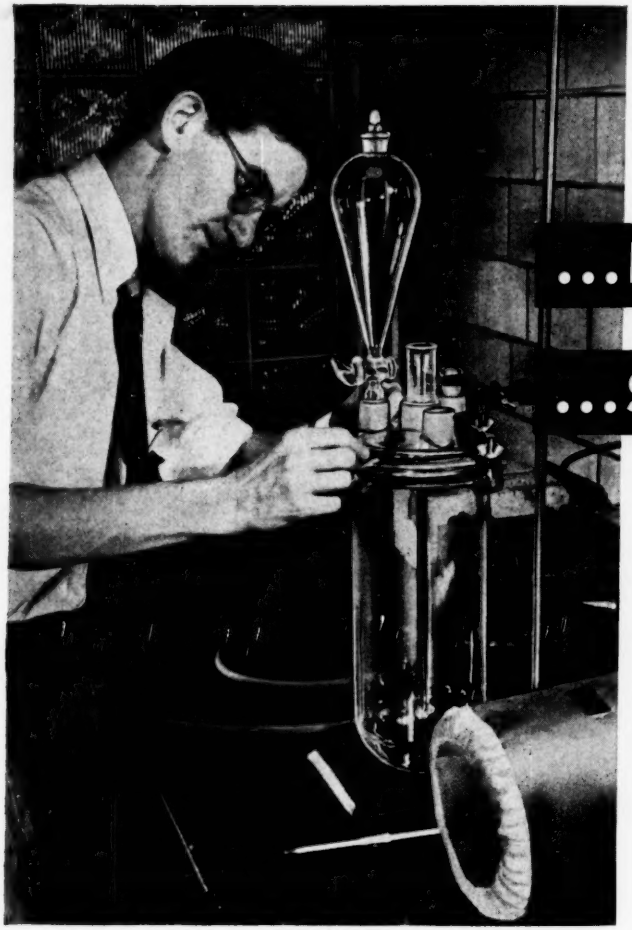
SEE OUR CATALOG IN SWEET'S

See our catalog P $\frac{1b}{2}$ Sweet's Processing Industries File

Write for bulletin 108-

ERIEZ MANUFACTURING COMPANY

101 East 12th St. • ERIE, PA.



...NEW

...STRONGER

T.M. REG. PYREX U.S. PAT. OFF.

Brand GLASS REACTION KETTLES!

Here is another new product of Corning Research . . . sturdy PYREX brand glass reactors for organic solutions involving viscous materials. The lower section is mold blown for maximum strength and, of course, gives you all the advantages inherent in PYREX brand glass. The top is of heavy pressed construction. A wide opening permits easy access to the interior. Thus, you can use these PYREX reactors for a wide range of service.

PYREX brand reactors are available now from your laboratory dealer in 2000, 3000 and 4000 ml capacities with interchangeable tops—the undersurface of which is fine ground to assure a tight seal. The four top openings accommodate interchangeable ground joints for quick assembly to condensers, stirrers, funnels, etc.

Clamps for securing top to vessel as well as heating mantles are also available from your laboratory dealer.

Stocked by Leading Laboratory Supply Houses

CORNING means research in GLASS

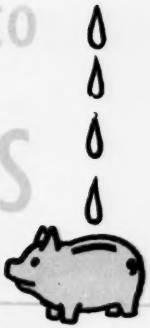
PYREX

CORNING GLASS WORKS • CORNING, N. Y.

LABORATORY GLASSWARE

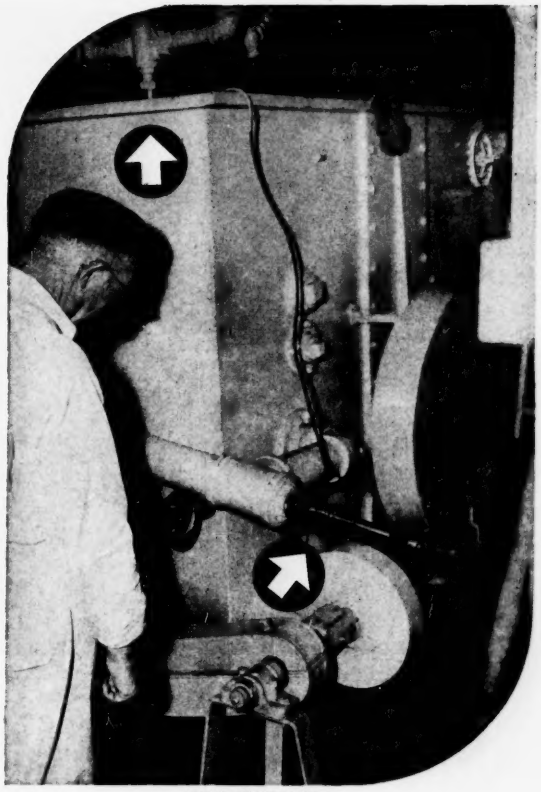
TECHNICAL PRODUCTS DIVISION LABORATORY GLASSWARE • SIGNALWARE • GLASS PIPE • GAUGE GLASSES • LIGHTINGWARE • OPTICAL GLASS • GLASS COMPONENTS

HOW SARCO SAVES



WATER

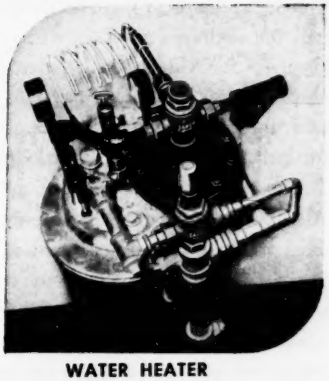
This can cooler handles 40 No. 10 tins of chocolate and cooked foods per minute. The water temperature must never exceed sixty degrees, but the load and the incoming water temperatures vary. The simple hook-up of a Sarco TR-21 regulator holds the tank water within the required limits, day after day, without supervision. The water saving alone paid for the change in a few months and can cooling is now automatically uniform.



CAN COOLING

Each oil cooling system on a battery of plastic presses required a full stream of city water—a six inch pipe running wild at $500 a month for the plant. Sarco Control reduced the stream to a trickle and the entire battery and all air compressors are being Sarco equipped with a total saving estimated at $300 a month. Ask for Catalog No. 700.

You also can save hot water with Sarco by having temperatures correct at all times. The Instantaneous Water Heater shown at the right has two Sarco Controls, one for the hot water and one for blended water. Catalog No. 600.



WATER HEATER

230

SARCO

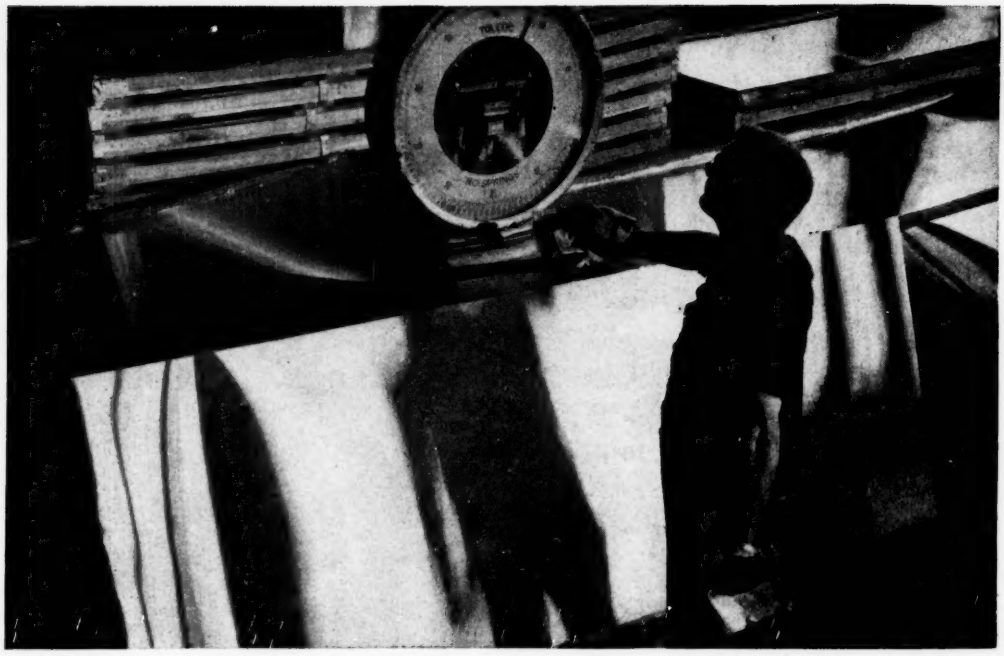
SAVES STEAM

SARCO COMPANY, INC.

Represented in Principal Cities

Empire State Building, New York 1, N. Y.

SARCO CANADA, LTD., TORONTO 5, ONTARIO



Call Ryerson for Allegheny Stainless

Every Kind, Shape and Size in Stock

When problems of heat or corrosion resistance call for stainless steel, it will pay you to call Ryerson for Allegheny Stainless. You get quick shipment of any quantity. The same prompt, personal service whether you need a single piece for test installation or a carload.

You can call, confident of getting the best. Allegheny Metal is the time-tested stainless steel made by America's oldest stainless producer. And just as Allegheny was the pioneer manufacturer; so Ryerson was the first to offer stainless from stock. A quarter century of stainless experience enables us to give practical, profitable assistance in specifying and fabricating.

Expert counsel is always available to you at any one of our thirteen conveniently located plants. So contact the plant nearest you—a sure source for stainless.

Principal Products

BARS—Carbon and alloy, hot rolled and cold finished, reinforcing

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Sheared and U. M., Inland 4-Way Floor Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

STAINLESS—Allegheny sheets, plates, tubes, etc.

MACHINERY and TOOLS—for metal working

Joseph T. Ryerson & Son, Inc., Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

for stainless

RYERSON ^ STEEL

"Give us the tools . . ."

Now is the time to *FIGHT SOCIALISM* in Washington

Do we want to follow Britain down the economic skids?

We Americans face that question today. For we are being advised by Administration economists in Washington to take the course which destroyed Britain industrially. It is the temporarily easy course of cutting down expenditures for tools in order to have more things to consume right away.

The President's Council of Economic Advisers tells us we are spending too large a part of our national income on new tools and equipment. A larger share, they say, should go for goods and services used directly by consumers.

Before we take that advice, let us look at Britain. When the British once allowed their industrial plants and equipment to run down – they started down a dreary road to industrial stagnation and decay.

British industry once ruled the world. Low production costs enabled it to undersell all competitors. Efficiency gave British workers the highest living standards anywhere.

Now all that Britain has between it and economic disaster is pluck and American aid through the Marshall Plan.

The British people are living poorly – still on rations and in austerity. With practically everyone working, and working longer hours than we do in the United States, they cannot produce enough to pay for the raw materials and food they must import.

How did Britain get in this fix?

The story is complicated. British sacrifices in two wars play a tragic part in it. But another fact also stands out:

Britain began to go downhill even before World War I – when British industries allowed their plants and equipment to grow obsolete.

Once that process started, it grew steadily worse. By 1929 the share of Britain's national income being plowed back into capital investment had shrunk to less than two-thirds of what it had been twenty years earlier. We were putting twice as big a share of our national income into capital goods at this same time.

Skimping on capital equipment – on new plants and new tools – put the skids under industrial Britain.

World War II only speeded up a process already well under way.

continued on next page

British industry today shows the results of its failure to keep up to date. Here are three examples found by Dr. Laci Rostas, Britain's leading authority on measuring workers' productivity:

An American produces *four* times as much pig iron as his British counterpart.

He produces *more than four times* as many tires.

In all industry, on the average, an American produces almost three times as much.

The real reason is the American's better tools. The British are struggling with equipment that is, on the average, forty years old.

Britain once had a big head start in industrial equipment. But she let it slip away. And as it went, Britain's industrial and political leadership slipped with it.

How could British leaders have slept while all this happened?

This, too, is a complicated story. But parts of it stand out clearly:

1. *British business men put in more time perfecting cartels to avoid competition than they did in improving their plants and equipment to meet it.*

2. *British labor leaders concentrated on sharing the work and sharing the wealth—rather than doing the job necessary to have enough wealth to make the sharing worthwhile.*

3. *British governments taxed away the means to buy new equipment. By steadily increasing personal taxes, they undercut the* ability *of individuals to invest in new equipment. Finally, they took away the* incentive *to get new equipment by progressively taxing away any returns on it.*

4. *Farseeing socialists smiled all the while, knowing that as private industry more and more lacked the tools to do a progressive job, they would have their chance to run the country.*

Now, with Britain's fate in their hands, the socialists are trying desperately to stem the nation's economic decline by rebuilding its industrial plants and equipment.

They are making a little headway, but not enough. There are several reasons. One is that Britain must export most of the new equipment she can make. *Another major reason—increasingly important for her future—is that money needed to renovate Britain's run-down industry is taxed away to support welfare programs.* The (London) *Economist* grimly puts it this way:

"The importance of the function of saving has only been discovered now that the means of saving have largely been destroyed."

Our own Federal and State governments, too, have dangerously whittled away incentives. They have more than tripled tax rates on personal and corporation incomes in the last twenty years. Now, the President proposes to do more whittling.

If the United States is not to go Britain's way, we must preserve our incentives to save and to invest in industry.

If the United States is to progress, we must continue to build up our industries.

The President's Economic Advisers say we can slow down. But the McGraw-Hill survey of "Business' Needs for New Plants and Equipment," reported in the previous editorial in this series, produced facts to the contrary. It showed that industry *now* plans—*if it can get the money*—to spend $55 billion in the next five years for new plants and new tools. Moreover, it showed *industry's needs* for new facilities are large.

By cutting down the incentives to save, by giving soothing advice that we do not need to save so much, Washington is pushing us toward Britain's way—the route via industrial stagnation to socialization.

Before we skid too far, we should pull up short and ask ourselves: Do we want to go Britain's socialistic way?

There still is time to say, "No."

President, McGraw-Hill Publishing Company, Inc.

A complete report on our national survey, "Business' Needs for New Plants and Equipment," may be obtained by writing McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y. This is the fifth editorial of a special series on industry's needs for new plants and equipment.

MARCH, 1949

Food Industries

Lower Costs Needed in Food Distribution

Consumer resistance to food prices continues strong. It has not been lessened by the drop in prices nor by the fact that the average family now spends only 21 percent of its income for food compared to 23 percent prewar. And this consumer back-pressure likely will continue for some time to come.

There are a couple of good reasons: With durable consumer products—from vacuum cleaners to automobiles—more readily available, more income is going into payments for such items. Secondly, the postwar boom is leveling off and could easily recede, causing more unemployment.

Because there was little besides food, clothing and shelter to take the consumer's dollar for several years during and after the war, people spent relatively freely for foods. But that honeymoon for the food industry has ended. New cars, television sets, refrigerators, washers, furniture and other household products cut into the food budget. To make the monthly payments on these, people are willing to eat more frugally. It is a wonder that the average family can afford to eat adequately and pay nearly $100 monthly on a new automobile.

Assuming then, that food-price pressure will continue because of budget pinching, how are lower prices to be achieved? The parity-price system will tend to keep the processor's raw material costs high. Labor costs are not likely to drop soon—they may go higher, in fact. Freight rates are up 52 percent over 1939. And processors made only 3 cents on the dollar in 1948—meat packers only ¼ cent a pound—leaving little room for price reduction other than that obtained by advanced food plant engineering.

This indicates that price reduction will have to come principally from lower distribution costs. The retail phase of distribution alone takes about 25 cents out of the food dollar on the average—much more for some products.

Fortunately, progress is being made in reducing distribution costs through greater efficiency in wholesale and retail operations.

Wholesalers are introducing more efficient materials handling and otherwise cutting costs so as to give independent retailers prices which are competitive with those of the chains. Alert wholesalers have come to realize that the more they help the independent retailer, the better their own business will be. There are many wholesalers who are delivering merchandise to retail stores at prices ranging from 4 to 7 percent over car-lot costs.

In retailing, the trend to the efficient self-service system continues. More than half the volume of food sold by independents is handled in self-service stores.

Sale of prepackaged produce is gaining because it increases impulse buying, saves labor through self-service, and reduces deterioration and shrinkage of the product. Prepackaged fresh cuts of meat are reported to be sold in 250 to 300 stores in the country. Even fresh fish is being prepackaged.

Among mechanical innovations contributing to efficient retailing must be mentioned the Food-O-Mat, 100 of which are in operation or in process of installation. Here the cans and packages are on inclined racks. When a customer takes the first package on the rack, others behind it slide down to fill the empty space. This gravity grocer is said to save up to 40 percent of the customer's time and half the store floor space.

And efficient supermarkets continue to gain in numbers. It has been estimated that 800 new supers opened last year, compared to 430 in 1946 and 502 in 1947.

Yes, the distribution trend is in the right direction. To speed it, processors should do what they can to help cut costs between factory and consumer.

—F. K. LAWLER, *Editor*

The Talk of the Industry

Beer Socialized in New British Towns

Nationalization has gone too far in England: It is to embrace the new "pubs" in the new towns being built by the state. And the government already owns more than 300 pubs in three state-managed districts that have existed since World War I.

Not only will the pubs be state-owned, they will sell state beer. And the breweries in the districts to be incorporated in the new towns will be owned by the state.

In England, the pub is the poor man's club. Beer is the quintessence of his leisure-time pleasure. These private privileges are almost as sacred as the secret ballot.

If the Britisher is to let his private life be socialized, then there is little chance for industry to escape. If that's what they want over there, let them have it. But we hope it doesn't give our government any ideas.

Malthusian Hunger Postponed

Grim significance might be found in the fact that the January 1949 issue of "Proceedings of the Academy of Political Science" is labelled *FOOD*. Most of its 123 pages is a report of the November 1948 annual meeting of the academy devoted to a reexamination of the Malthusian Doctrine. A review of its contents shows, however, that Malthusian hunger is still for the future. One speaker calculates the world could feed possibly 3.6 billion inhabitants compared to the present 2 billion. Nevertheless, he admits that population pressure continues to be at the bottom of many of the troubles of the nations of the world.

Customers Tell A & P What to Do

"Everybody in the food field is going to have to spend more time, effort and money in finding out what the consumer wants and in giving it to her," says A & P's John Hartford. "Our company, for instance, ran an advertisement in 2,000 papers . . . . asking customers for suggestions. The thousands of answers helped us plan for the coming year."

Bet a lot of processors who can't afford surveys keep a close eye on A & P.

Keeping Labor Cool

If air conditioning is installed in an ultra-modern new plant, some companies feel that it ought also to be provided in their older factories. The reason is a matter of labor relations. If employees work in conditioned comfort in the new building, then those in the other buildings will feel slighted if they don't have it.

In the food industries, air conditioning often is installed to improve operating conditions or quality of product. Which is an even more important reason for not slighting any of your factories.

Is It Good to the Last Bite?

Proper reclosure of food containers has long been recognized as extremely important. The other day we heard a new argument for it. The customer considering repurchase of a food is most likely to remember the taste of the last—not the first—portion of a previous purchase. If the container did not protect the goods to the last using, the recollection is unfavorable, repurchasing is less likely.

Peanut butter was cited as one example of a product involving this problem. When that material has stood open, or practically open, to the air during the last week or two before emptying of the jar, it is a good bet that the last usings were relatively unpalatable.

Two questions should be asked about reclosures: Do they really work? Are they easy to apply? If your reclosures don't meet these requirements, your product is not likely to be good to the last bite.

Science With a Sales Angle

If you make a high-carbohydrate product, you may want to convince mothers that they should feed it to their children between meals. If so, Dr. Robert C. Hockett of the Sugar Research Foundation has supplied some impressive arguments: Children's small livers store relatively little carbohydrate. Besides, the little fellows have rapid metabolism. And when the supply of carbohydrates runs out, the liver must draw on muscle tissue, producing a substitute known as "ketone bodies," which induce "ketosis." If this continues too long, the blood becomes more acid than normal, general dehydration takes place, and severe vomiting may occur.

That should do the trick!

Hors d'Oeuvres

■ General Eisenhower polishes off a soup recipe that takes two days to complete with the suggestion that, in season, you can cut up a few nasturtium stems, boil them, and add one tablespoon of the result to the soup. Somehow this sounds like something Campbell isn't going to want any part of.

■ Know what the National Association of Retail Ice Cream Manufacturers is cooking up? Summer breakfast! Instead of an egg, you get a dip of ice cream, with a doughnut where the ham should be. We can hardly wait to get the reaction the first time this is served to a hearty-breakfast advocate.

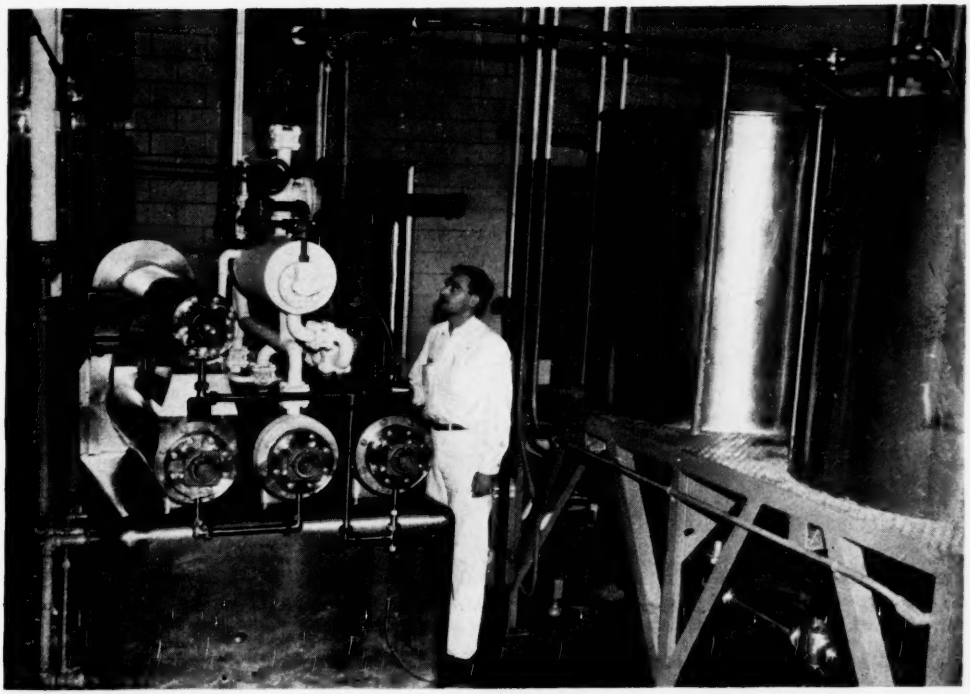
■ USDA is discovering that cross breeding of cattle lends "hybrid vigor" that results in production of more milk with a consequent lower cost per quart. But cattle are funny. Bet the bulls aren't a bit interested in the lower cost angle.

■ Apparently, coffee shampoo was only the beginning. Now there are coffee soap powders that are said to clean just about everything, including the coffee pot. But Coffette Products, Inc., has yet to come up with a really handy one that you can both drink and dunk the baby in.

■ As a consumer, you are expected, this year, to use up 70 lb. of pork, 60 lb. of beef, 9 lb. of veal and 4 lb. of lamb and mutton. Veal, lamb and mutton don't seem to have caught on, do they?

■ Dr. H. K. Mitchell, Caltech biologist, and associates used 30 tons of spinach, from 1941 to 1943, in isolating 1/1,000th of an ounce of folic acid. Even the children are anxious to give the world thousands of gallons of the stuff by this method.

J.A.J.J.



MAKING starch paste. Votator processing system supersedes batch method of cooking starch slurry for salad dressing.

High Efficiency Attained on Multi-Product Line

Continuous processes in Durkee plant speed cooking and cooling of starch paste for salad dressing. And same processing line "doubles" on mayonnaise and sandwich spread

JOHN V. ZIEMBA
Assistant Editor,
"Food Industries"

A highly integrated, continuous, processing system for the manufacture of dressing products is being operated by Durkee Famous Foods in its new plant at Norwalk, Ohio. This development is in line with the expansion program of this Glidden Co. division.

Reasons for this expansion are to: (1) Supply distributors with a more complete line of Durkee products, (2) provide for additional outlet for vegetable salad oils refined in the company's own refineries, and (3) maintain year 'round employment for workers at the margarine plant, which is close-by.

Dressing products recently added are mayonnaise, salad dressing, and sandwich spread. Others to come will include French dressing and vegetable salad oil.

The manufacture of dressing products gives the company an additional outlet for its refined vegetable oils. By using company refined oils, control is constantly maintained over the quality of this principal dressing ingredient. Such control, together with rigid analysis of other incoming materials and finished products, insures uniform quality, flavor, and smoothness of all dressings produced. Furthermore, by employing the most modern, fully automatic equipment, dressing products are never touched by hand. All equipment is of stainless steel. It is thoroughly cleansed and steam sterilized at least once daily.

Steady employment has been achieved following the location of the new dressing plant next to the margarine plant. Personnel has been trained to work in both plants. For when production in the margarine plant declines between May and September, workers are then shifted over to the dressing plant, where production is going full blast.

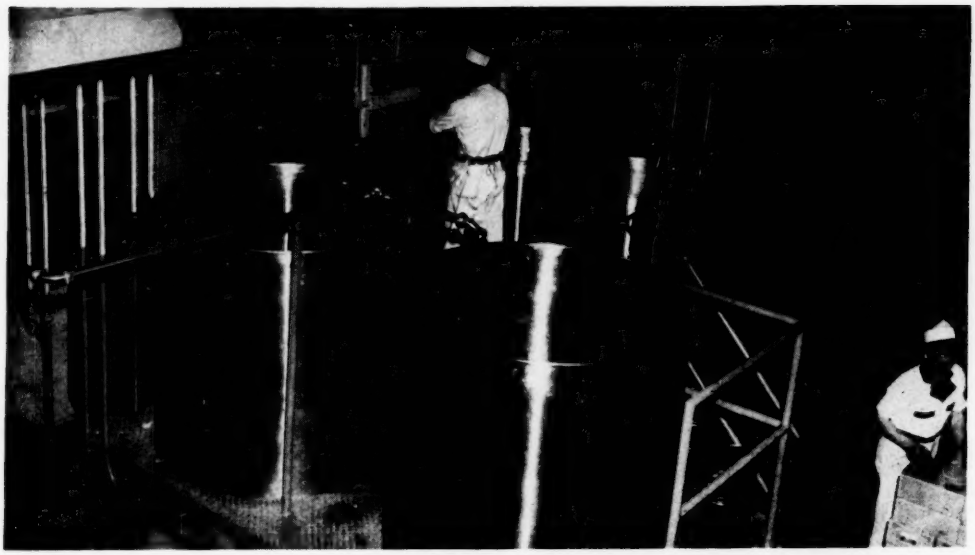
Special Fold-Out Picture-Flowsheet Of Durkee's Operation Is Presented on Pages 124-127

Provisions Made for Expansion

The new one-story building is modern and sanitary. It was designed to permit most efficient production layout and to enable double production in the future with minimum additional equipment. There is space in the processing area for another dressing line, also about 60 ft. of space along one side of the processing area for even further expansion.

Doubling of present capacity will not require additional starch-slurry mixing, slurry holding, gelling, and premix tanks. However, it will be necessary to install additional Votator

Blending of Ingredients With Paste Completes the Salad Dressing . . .



PASTE from processing units (photo preceding page) is delivered to gelling tanks (forground), then metered to premixers (rear) in which it is blended with other ingredients. Operator at control board handles the metering.

cooking-cooling units and another emulsifier (colloid mill).

The attractive exterior of the plant consists of brick and stone, with glass blocks on the south and west, and steel sash windows on all other sides. Interior walls are of cream-colored glazed tile. The ceiling, constructed of reinforced concrete slabs that are painted a light blue, is supported on steel trusses. Floors are of concrete and painted with a gray enamel. Fluorescent lighting is provided throughout. A lunch room, lockers, and washrooms are adjacent to the storage area.

Raw Material Delivery and Storage

Oil and vinegar storage tanks are located in a separate room, adjacent to the railroad siding, processing and raw material storage areas, and the compressor and cold storage rooms.

Blended oils—chiefly corn and cotton seed—are delivered to the plant in tank cars. Black iron pipes and fittings and a centrifugal pump are used to unload the tank cars. The oil is then pumped directly into two black iron storage tanks, the two holding a total of 16,000 gal.

Distilled, aged-in-wood vinegar arrives at the plant in wooden tank cars. It is pumped by a stainless steel centrifugal pump through stainless steel pipes into two cypress tanks, each holding 4,500 gal.

Other raw materials are delivered in box cars, loaded onto pallets, and carried by forklift truck to the raw materials storage area. Fine granulated cane sugar, flake salt, stabilizer, and purity PWS starch (a specially processed corn and waxy maize starch) are received in paper bags holding 100 lb. Sandwich relish arrives in wooden barrels. And 8-, 16-, 32-, and 128-oz. glass jars are shipped in cartons.

Eggs, frozen in 30-lb. tins, are also loaded on pallets and transferred by forklift truck to the cold storage room. Combination spice oils, in 5-lb. bottles, are shipped to the laboratory, where they are measured in amounts sufficient for batches in premixers.

Refrigeration is furnished by two 4x4 and one 6x6 reciprocating ammonia compressors. One 4x4 compressor maintains temperature in the frozen egg storage room at 4 to 6 deg. F. The other cools the oil before it is metered into the premix tanks. The 6x6 compressor cools the cooked starch paste in the Votator processing equipment.

Salad dressing is a mixture of starch paste and mayonnaise—an emulsion of starch paste and vegetable oil, using egg or egg yolk as the emulsifying agent. The paste is prepared by cooking the starch slurry, and then cooling the paste before it is added to oil, spices, and eggs in the premixer.

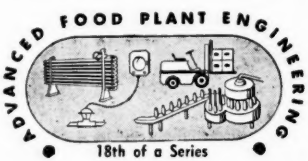
The paste is made up in an enclosed room, called the starch-slurry room. Mixing is localized in this room to: (1) Confine starch and other dusts, and thus keep them from spreading into other areas in the plant; (2) minimize propagation of yeasts and molds on wet starch and sugar medium and subsequent contamination of product, and (3) reduce the dust-explosion hazard.

The starch-slurry mix is prepared in a 200-gal. stainless-steel slurry tank which is equipped with a portable propeller mixer and set upon a tank scale. Water and vinegar are first weighed into the tank, then starch, stabilizer, salt, and sugar, in the order named because of different solubilities.

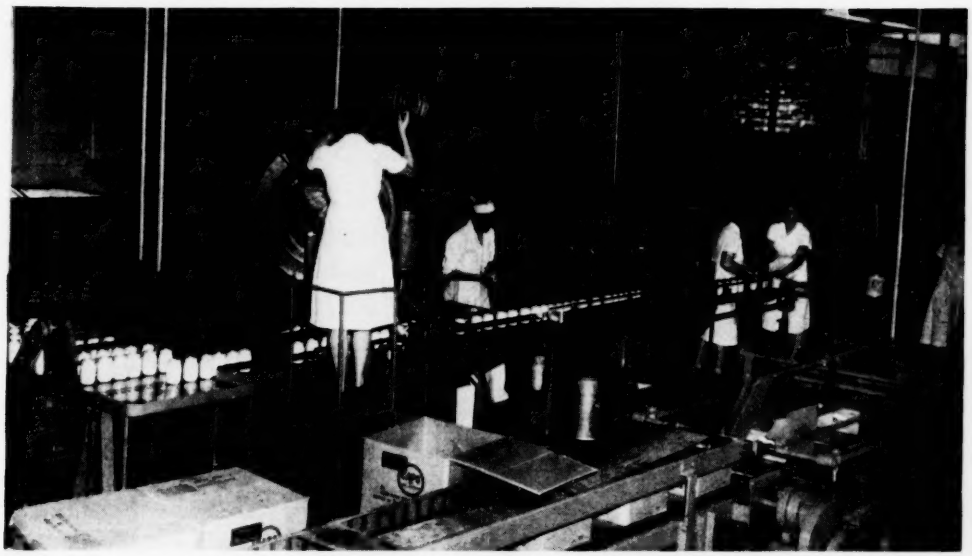
This starch-slurry mix is then pumped into a 300-gal. stainless-steel holding tank. Purpose of this holding-tank is to keep sufficient slurry on hand so that it can be continuously cooked and cooled. A portable propeller mixer maintains the slurry in a uniform suspension.

Starch Paste Made Continuously

Steady flow of slurry from holding tank through the Votator processing equipment is provided by a positive delivery duplex piston pump with a speed controller. Here, the slurry is cooked and cooled in a matter of seconds. Previously, in making starch



. . . Then Jars are Filled, Capped, Labeled, and Cased



ON HIGH-SPEED packaging line (starting at left) jars are filled, conveyed passed capper, and on through labeler, after which they are cased (rear, right). Cases are then conveyed to gluer (foreground). Girl on stand reloads capper.

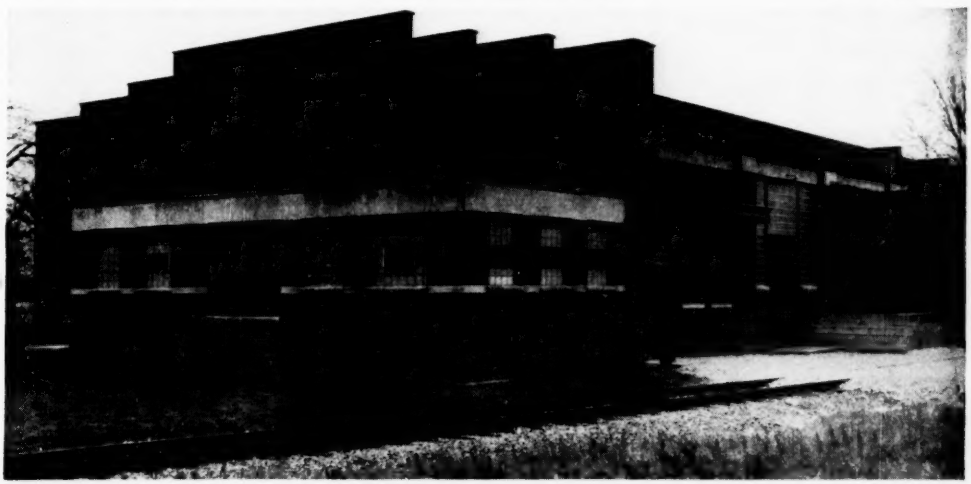
paste by the batch method, some manufacturers not only thought it necessary to reach the desired cooking temperature, but also to hold the cooked paste at this temperature for 5 to 15 minutes. In addition to rapid cooking and cooling, the continuous system is completely enclosed. Thus, bacteria and other contamination is avoided.

Through vigorous agitation, rapid heat transfer, precise control of temperature and viscosity of starch paste, and rapid cooling, a uniform paste is constantly obtained. Close control is maintained to about ± 1 deg. F. by temperature recording instruments.

The slurry is cooked and cooled to a paste at the rate of 1,500 to 2,500 lb. per hour in four Votator processing units. Each unit consists essentially of concentric tubes which form two annular spaces around a central agitating shaft. The heat transfer medium flows through the outer space, the product through the inner one around the shaft, and heat passes through the tube wall from one to the other. To conserve heat, the outer tube is jacketed with insulation, which in turn is covered with stainless steel.

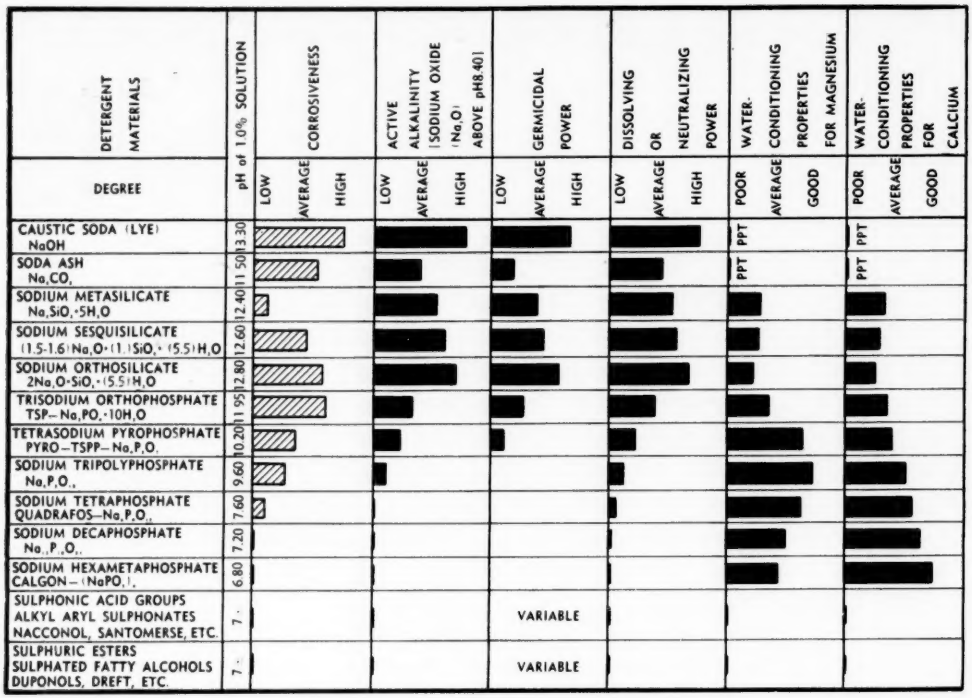
Because of the small holding capacity of the tubes, high-speed agitation —500 rpm.—is utilized to provide thorough mixing. Also, the large heat transfer surface permits high heat

(Turn to page 200)



THIS MODERN, one-story building assures steady, year 'round employment for Durkee personnel at Norwalk, Ohio. Equipped with one continuous line, plant makes about 800,000 lb. of dressings a month. And there is space for expansion.

DETERGENT GUIDE—Properties of Various Materials



How To Select Detergents for Food Plant Cleaning

To obtain the right results—and to avoid costly mistakes—in the use of cleaning agents, you must understand the fundamentals of detergency presented here

IRA I. SOMERS

National Canners Association Research Laboratories, Western Branch, San Francisco, Calif.

Because of the multiplicity of cleaning tasks in food plants, the selection of the right kinds of detergents is of the greatest importance. Washing with water alone often is inadequate for effective cleaning, and the addition of cleaning aids frequently is necessary. The purpose of this article is to acquaint the reader with some of the fundamentals which will enable him better to evaluate detergents for use in his plant.

A great many proprietary compounds are available, from which a selection can be made. And unless the sanitarian is acquainted with the necessary properties of a detergent for a particular cleaning job, misuse may result. Serious corrosion and ineffective cleaning have been observed where the wrong detergents were employed.

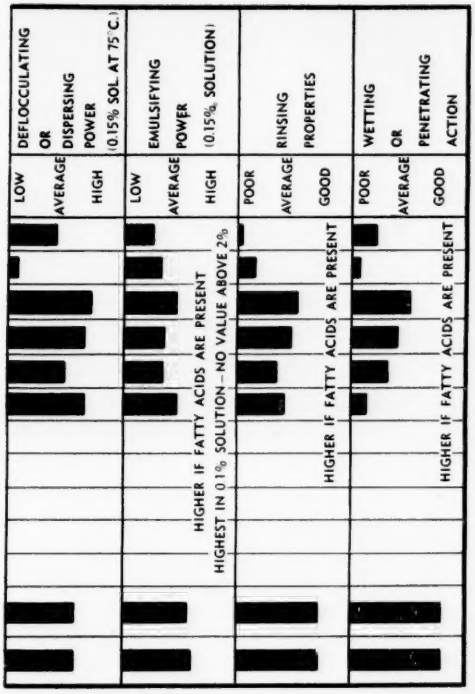
In most cases, mixtures of two or more ingredients give greater efficiency than single chemicals for general cleaning purposes, because the desirable properties of each component usually are manifest in the resulting mixture. Most proprietary general-purpose cleaners are mixtures containing two or more ingredients.

The desirability of a detergent usually is determined by the degree to which it exhibits these characteristics:

1. High wetting or penetrating action, which effects rapid washing away of the soil.
2. Good rinsibility, which results in the detergent and soil being rinsed from the equipment freely and rapidly after the desired cleaning has been accomplished.
3. High emulsifying power for oils.
4. High deflocculating or dispersing power, to bring deposits or precipitates into suspension so that they can be washed away.
5. Water conditioning or sequestering properties in alkaline solutions, to prevent deposits on equipment of the calcium and magnesium hardness from the water.
6. Dissolving and neutralizing power, for the purpose of dissolving or neutralizing tenacious deposits and saponifying fats to make them soluble in water.
7. Low corrosiveness to the surfaces on which they are used.

In certain applications it also is desirable that detergents have high active alkalinity and germicidal properties.

The properties and relative effectiveness of the more commonly used detergent ingredients are illustrated by bar graphs on the chart above. It is apparent from this



Note: This chart was prepared from a review of the literature listed at the end of this article. In making a chart of this type, it is difficult to give definite comparisons of certain properties because they often vary, depending on the concentration of the solution, the temperature at which it is used, and the other ingredients in the mixture. Therefore, the values indicated by the bar graphs are not absolute, but show general relationships only. Where no indication is given, it means that this material is not important as far as the particular property is concerned, or that there was not sufficient information available to include in the chart.—The Author.

chart that no two compounds have exactly the same properties. Some are good for producing certain detergent effects, while they are of little value for other purposes. Thirteen detergent materials and ten properties are included.

Evaluation of Various Detergents

Caustic soda, or sodium hydroxide, is the alkali most commonly used in strong caustic detergents. It is cheap, has high alkalinity and rapid dissolving power, and can also be used as a germicide. But caustic soda is lacking in many desirable detergent properties, and when used alone it is very corrosive to most metals other than stainless steel. Unless a phosphate is present, caustic soda rapidly precipitates calcium and magnesium hardness from water.

Soda ash is similar to caustic soda in its detergent properties, but it has a somewhat lower alkalinity, and less dissolving power. It serves as a buffer in alkaline detergent solutions, and is of value when acid deposits are to be dissolved.

The sodium silicate detergents are made by combining sodium silicate and caustic soda in various proportions. Sodium metasilicate is the least alkaline and is the one most commonly used in cleaning agents. Silicates are fair detergents when used alone, having good wetting, rinsing, emulsifying, and deflocculating properties. But they generally are more satisfactory if mixed with other detergent materials. Sodium metasilicate is extensively used as a corrosion inhibitor for caustic soda. It not only is non-corrosive, but prevents corrosion by other alkalis in a solution. Sodium sesquisilicate and orthosilicate are intermediate in their properties between metasilicate and caustic soda.

Trisodium phosphate is below average in wetting properties, but is fairly high in rinsing, emulsifying and deflocculating power. It also is a fair water conditioner and has been used extensively in dish-washing compounds. Its corrosiveness, however, has limited its use on aluminum and tinned surfaces to a certain extent.

Tetrasodium pyrophosphate is used largely as a water conditioning or sequestering agent, although it possesses other desirable detergent properties. This compound "conditions" water by forming soluble salts of calcium and magnesium.

Sodium tripolyphosphate, sodium tetraphosphate, sodium decaphosphate and sodium hexametaphosphate are known as complex polyphosphates or phosphate "glasses." Their primary use is as water conditioners or sequestering agents. They "condition" water by forming soluble compounds of calcium and magnesium. Their effect is not all limited to sequestration, however, because they exhibit some surface-active properties even in soft water.

The water conditioning properties of these polyphosphates vary. Sodium tripolyphosphate is the most effective for magnesium and the least effective for calcium. And sodium hexametaphosphate is the most effective sequestering agent for calcium and the least effective for magnesium. These phosphates are unstable in hot solutions and in the presence of strong alkalis, which limits their use under these conditions.

Of these four substances, tripolyphosphate is more stable and sodium hexametaphosphate is least stable, with the tetra and deca phosphates being intermediate.

The sulphonic acid group and sulphated esters represent many compounds of various detergent properties. The chart does not show the exact properties for every compound in each group. They all fall, however, into a general classification of surface-active or wetting agents, with similar properties in this respect. They are used extensively for such purposes, either as builders or as single chemical detergents.

All-Purpose and Specific Detergents

In general, detergents may be classified either as all-purpose or specific cleaners, depending on the properties exhibited. All-purpose cleaners possess most of the properties listed in the chart, and can be used for a variety of cleaning purposes.

Specific cleaners, on the other hand, are especially high in certain properties and usually are designed to remove deposits of a particular nature. They may not be of value for other cleaning purposes. As a rule, all-purpose detergents are composed of a number of ingredients, whereas the specific detergents are composed of only one or two compounds.

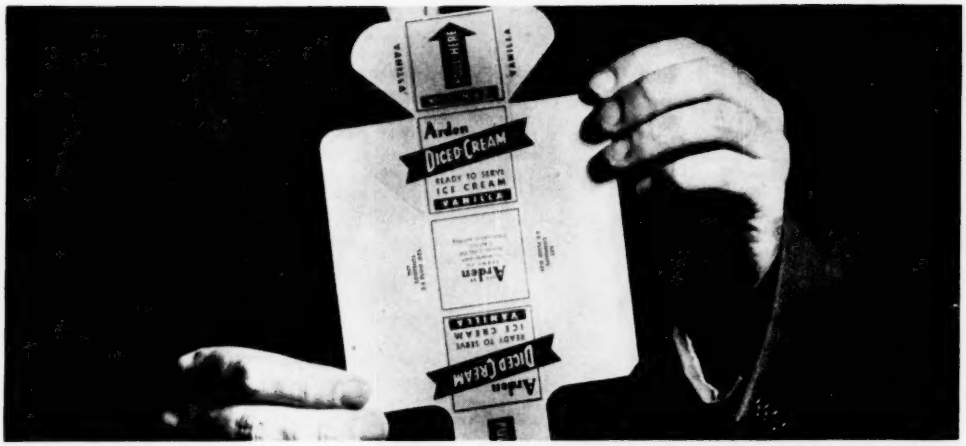
Detergent Mixtures

The mixing or formulation of detergents requires a knowledge of such factors as:

1. The detergent properties of the various ingredients.

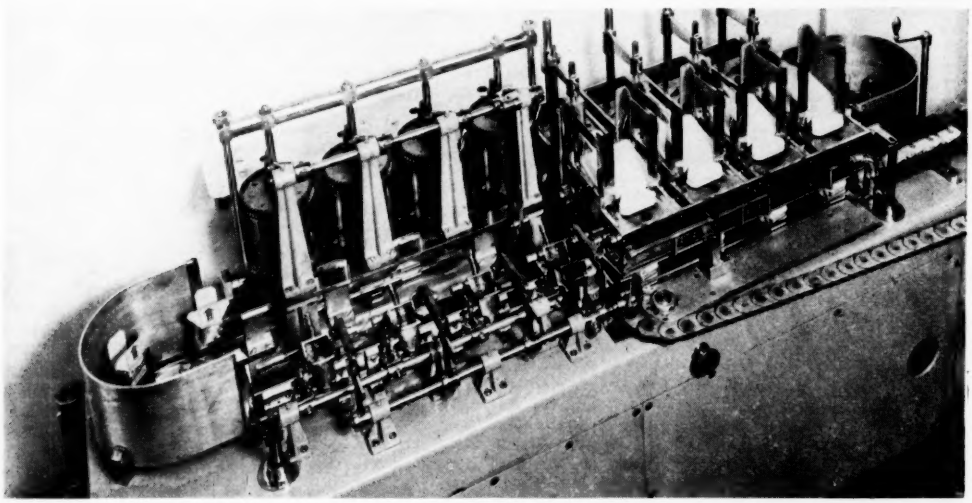
(*Turn to page* 206)

New carton



ONE-PIECE BLANK. It is automatically formed into carton, then filled with 3½ oz. of ice cream, closed and quick-frozen.

New machine



THIS is the special unit. It forms cartons four at a time, fills them with ice cream, closes and ejects them.

ICE CREAM SERVINGS IN "DICE" FORM

Individual portions for fountain dispensing, are now produced on machine that automatically forms, fills, and closes 6,000 cartons per hour

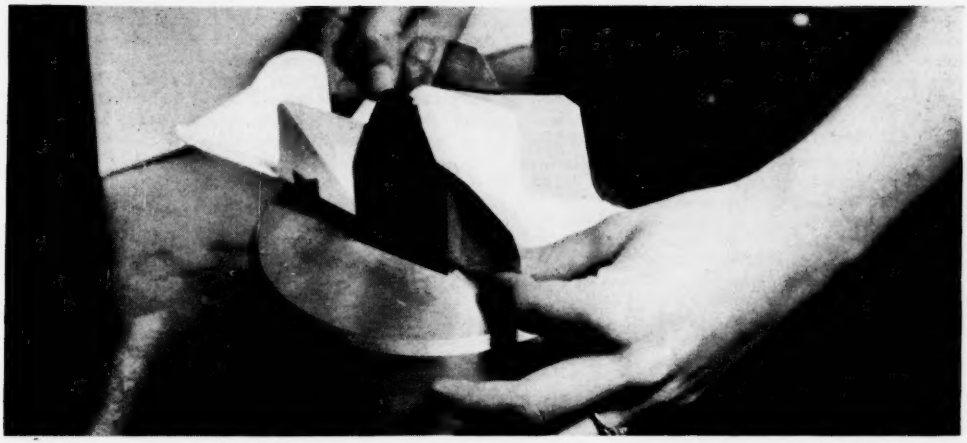
C. R. HAVIGHORST
Associate Editor "Food Industries"

Individual ice cream servings, packaged in cartons which assure their purity from factory to consumer, are now automatically manufactured at the rate of 6,000 per hour in the plant of Arden Farms Co., Los Angeles. The packages are specially designed for dish service in drug stores and confectionaries.

This "Diced Cream" is produced in a new machine, patented and manufactured by this company. It forms its own cartons from blanks, then fills them with ice cream, closes and fastens the lids, and ejects the packages onto a conveyor which carries them into a low-temperature hardening tunnel where the ice cream is quickly frozen.

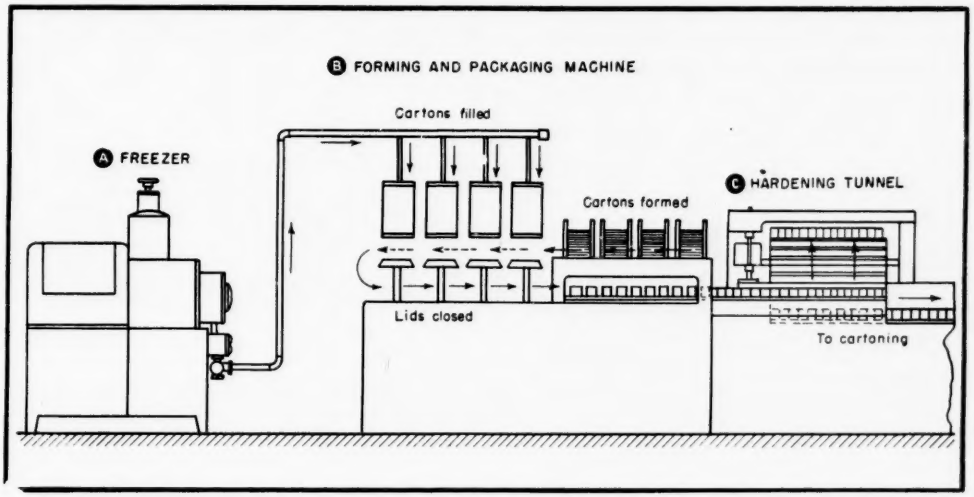
The manufacturing process, up to and following the new machine, is the same as any conventional bulk or packaged ice cream process. The product now manufactured contains 13 percent butterfat, and the overrun is 65 percent.

and its sanitary serving device



WITH aid of this special holder, carton is unfolded. Then without touching ice cream, clerk serves portion.

and its place in production line



THE ABC of Diced Cream production. Continuous freezer (A) feeds new machine (B), packages are frozen (C).

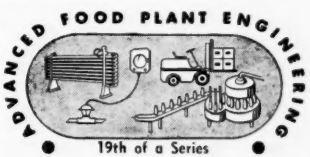
The unit automatically feeds four carton blanks at a time into position under the carton forms. Then four metal plungers shape them into metal jigs. These jigs are attached to an endless chain that moves in an elliptical channel around the machine. Each progressive movement of this chain advances the cartons to new positions.

After the cartons are formed, they are moved under the group of four filling cylinders. Each of these cylinders is comprised of two smaller cylinders, equipped with pistons and filling valves. As the empty cartons arrive beneath these valves, the pistons extrude 3½ oz. of ice cream into them—a quantity equal to the content of a No. 12 ice cream scoop.

The large filling cylinder then revolves clockwise, and positions its other filling valve above the point where the next group of empty cartons will arrive. While one cylinder is being emptied the other is filled preparatory to extruding its contents into the following series of cartons. The heavy consistency of the product as it comes from continuous freezers made necessary this dual type of mechanism.

Hardened at 40 Below

Next, the chain moves the filled cartons around the curve and positions them under the lid-closing mechanism. And after this operation, the filled-and-closed cartons move on to a point at the extreme right front side of the machine, where the jigs are automatically opened and the cartons are ejected onto a small conveyor. The cartons are now carried to the hardening tunnel, adjacent to the machine.



The belt which moves the cartons through this hardening tunnel is composed of a series of transverse metal channels which are approximately the same dimensions as the cartons. Temperature within the tunnel is about —40 deg. F.

How Tunnel Operates

First, the small conveyor moves the cartons to a receiving point, at the entrance of the tunnel. As soon as a sufficient number of cartons are collected here to fill one of the transverse channels, a metal arm pushes accumulated cartons into the channel. The belt then moves the product into the hardening tunnel, carries it to the far end, then returns it to the exit point. Here the cartons drop out of the channel onto another small conveyor and are routed to the casing department.

At the casing station, women pack sets of 20 of these small cartons into boxes, which are then placed in low temperature storage to await delivery.

The company is now filling 15 flavors and a complete line of sherbets in its Diced Cream cartons. The machine will handle flavored, candy, nut or fruit ice cream.

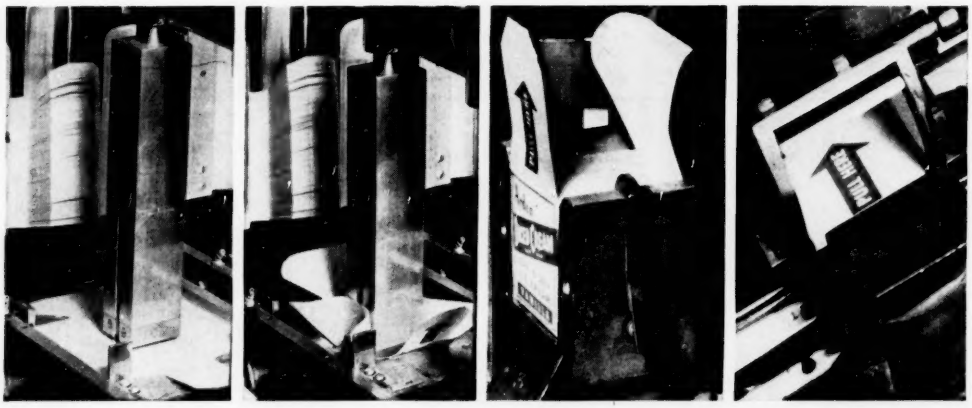
Untouched by Store Clerks

A special vise-like carton-holder (see photo) is furnished to stores for dispensing Diced Cream. The clerk merely places a carton in this holder and pulls the carton's two opening tabs. By this action, the sides of the carton are dropped away and the clerk then deposits the ice cream into the serving container.

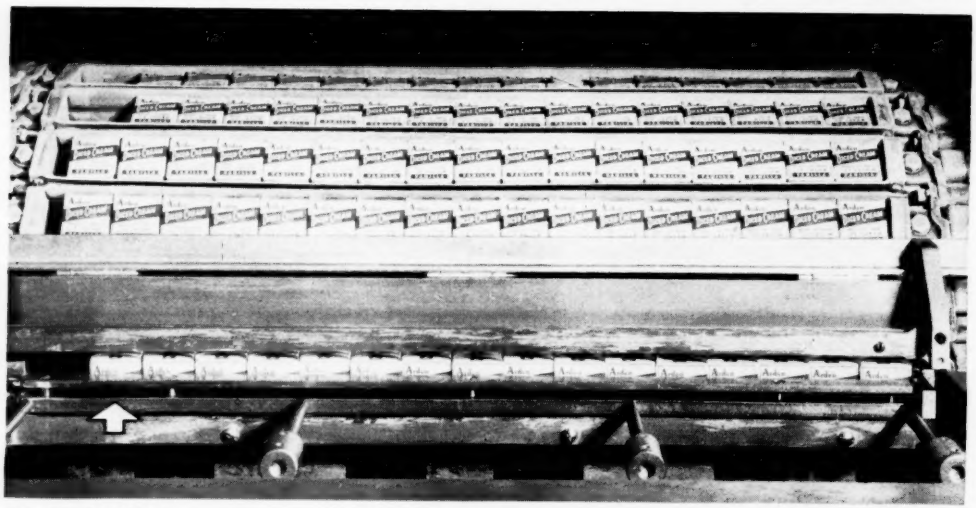
The Arden Farms Co. has also contracted for special glassware of new design and shape which accommodates the square portions of this new ice cream better than the conventional kind of glassware. These serving glasses and dishes are made available to retailers serving the product.

The company indicates that it will franchise the use of its machine to selected ice cream manufacturers. Franchise payments will be included in the cost of the special cartons needed for the operation.

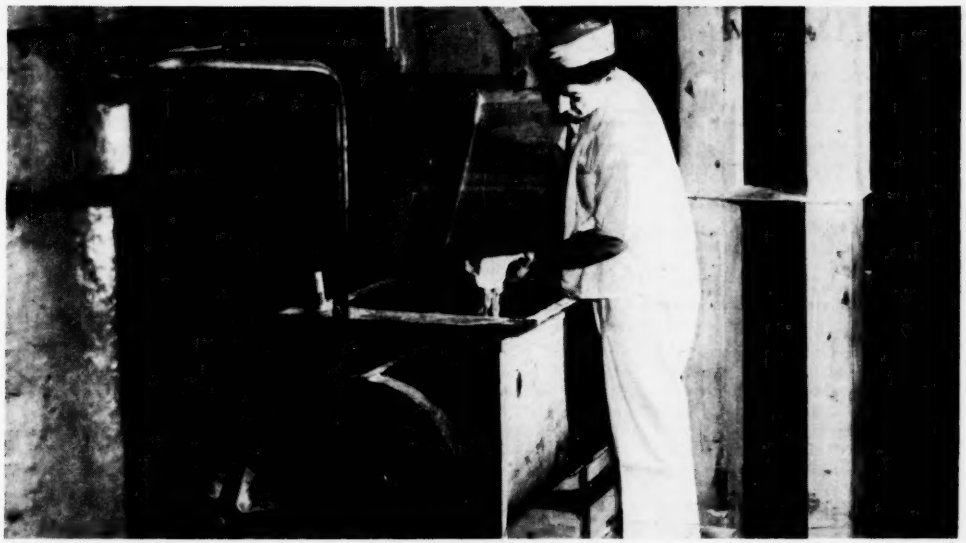
Closeups Show New Package in the Making



BLANK is centered over top of metal forming die. **PLUNGER** moves down and shapes carton into jig. **CARTON** is filled with 3½ oz. of ice cream. **LID** is closed, then package is ejected onto conveyor.



FILLED PACKAGE is conveyed to hardening tunnel (above) where it joins other packages getting quick freeze.



FORTIFICATION of macaroni at New Jersey plant of Buitoni Products, Inc., by the addition of natural nutrients.

Restoring Nutritional Values With Natural Substances

They add many little-known B-complex factors which are not found in synthetic vitamins, and also supply certain minerals and high quality proteins

JOEL B. PETERSON

Technical Consultant, Special Products Division, Standard Brands Inc., New York

If we could eat a variety of natural raw foods, it is probable that a study and discussion of processed food fortification would be unnecessary. Supplements, including vitamin tablets, would be useful mainly in therapeutics. But since we prefer foods that have been milled, refined or cooked, and as these processes result in discarding nutritionally valuable factors, a restoration of these losses is highly desirable.

Obviously there are good reasons for cooking, milling, refining and discarding nutritionally valuable parts of our food. It should not be inferred that such processed food is harmful, but with all of these processes being employed and apparently necessary, it would not be surprising if some of the destroyed or discarded material contained valuable and possibly necessary factors.

To make at least a partial compensation for losses to the diet taken as a whole, industry has contrived to supply fresh vegetables and to apply refrigeration and good transportation to meats and dairy products. And a beginning has been made in the restoration of vitamins and other factors to processed foods.

When fortification becomes necessary, the scheme of choosing a vitamin or factor that would occur naturally in the product is an excellent choice. Thus, vitamins A, D and E are fat soluble. It is natural that they would be found in fats and oils. The B complex vitamins are soluble in water. Their sources are yeast, liver, rice bran, cereals, and certain other fermentation products. Finally, vitamin C is found in acidic fruit and vegetable juices.

Several of the vitamins have been identified, synthesized, and used for restoration of some foods. This is a step in the right direction, but it would be unfortunate if our efforts were to stop at this point. The human need for thiamine, riboflavin and niacin is recognized by the Food and Drug Administration, and daily minimum requirements have been worked out.

But because many factors are missing from this list, we cannot rely on synthetic thiamine, riboflavin, niacin, panthothenic acid, pyridoxine and ascorbic acid for our entire vitamin supply. The missing factors come from natural sources. We know very little about them, but nutritionists are convinced that they are necessary nutrients, and that they should be studied further.

In addition to natural and synthetic vitamins, there are some that may be classed as semi-natural, such as certain vitamin D compounds. These are made by further processing natural substances. For example, yeast containing a provitamin, ergosterol, can be irradiated to produce vitamin D_2.

Minerals and Proteins Lost, Too

Certain minerals, also, are lost in the processing of foods. Evidence exists that many of our population need more calcium, phosphorus, iodine and iron. Requirements for these minerals have been worked out by the Food and Nutrition Board of the National Research Council and F&DA. Iodine is usually added in proper amounts in table salt. And iron occurs naturally, or has been added to a large number of foods without undue technical trouble. Calcium and, in some cases, phosphorus suggest special problems since the daily minimum requirement

Nutrients Lost in Flour Milling May Be Restored With Yeast

TABLE I—YEAST Contains B Complex Vitamins Found In Wheat Germ

	Micrograms Supplied to 100 g. Flour		
	By Wheat Germ†		By Yeast*
	at 1½ Percent	at 2 Percent	at 1 Percent
Pantothenic acid	30	40	125
Pyridoxine	9	12	30
Biotin	0.67**	0.9**	2.5
Inositol	10,350	13,800	4,000
Choline	6250–5,200**	8200–7,000	4,200
Folic acid	17	22	22

† University of Texas Publication No. 4237, p. 111
* From Fleischmann Laboratories
** From literature obtained by Fleischmann Laboratories

TABLE II—AMINO ACID Content of Years Compares Favorably With Wheat Germ

	Yeast*	Wheat Germ*
Arginine	4.0	5.4
Glutamic acid	14.0	13.0
Glycine	4.2	5.7
Histidine	2.0	2.1
Isoleucine	5.3	3.3
Leucine	7.0	6.6
Lysine	6.9	5.1
Methionine	1.3	1.24
Phenylalanine	3.8	2.5
Threonine	5.1	3.27
Tryptophane	1.5	1.0
Valine	5.5	4.4

* Assays conducted by Dr. Max Dunn, University of California, Los Angeles.

of each is high when compared with that of iodine and iron. If significant quantities of calcium and phosphorus are added to a food a chalky taste is liable to develop.

With special reference to calcium, it is of interest that white bread containing milk, dough improvers, and mold preventatives, actually contains more calcium than would be supplied if the bread were made from whole wheat.

Finally, there are two other food factors that are destroyed or lost through preparational processes—fat and protein. Nutritional studies that consider fat usually show that our diets have an excess of this factor.

There is evidence that some of our population need additional proteins, preferably protein of high nutritional quality. The Food and Agricultural Organization of the United Nations in 1946, indicated that the people of the United States should consume 17.6 percent more fish, meat and eggs, all protein substances.

If fish, meat and eggs cannot be supplied in the required amounts, then proteins now in the diet should be qualitatively improved. There is evidence that the protein of degermed cereals is qualitatively poor. If this is to be used for body building, it should be supplemented with certain amino acids, or by the addition of other proteins that contain appropriate quantities of the amino acids that are lacking. Yeast, soya or cereal germ and milk are excellent sources of these.

Vitamins A, C and D are stored in the body to such an extent that it takes considerable time for deficiencies to become apparent even if these vitamins are not eaten every day. Excess thiamine, riboflavin and niacin are not stored as effectively, and deficiencies develop rapidly. It is desirable, therefore, that B complex vitamins be eaten daily. In order that individuals on diets, restricted because of choice or necessity, be protected against deficiencies of these vitamins, restoration should not be limited to one cereal. It would be better to restore a number of selected foods so that every individual will be assured of receiving the vitamins he needs regardless of the food he eats.

The same reasoning may be applied to the supplementing of protein. When mixtures containing 9 of the 10 essential amino acids were fed to rats, and 2 hr. later the other essential amino acid was fed, the utilization of these nitrogenous substances was not good. If this time factor is important in human nutrition, then high-quality protein, when used to supplement poor protein, should be eaten with the poor protein.

Some Legal Aspects of Restoration

In studying an individual food with fortification in mind, the legal aspect must be considered. If the food is one for which the F&DA has previously elaborated standards, the problem of additional fortification or restoration becomes so difficult that there is a question in the minds of many as to whether it is worth attempting.*

If there is no F&DA standard for the food being manufactured, the problem becomes simpler. It is necessary to study the food to discover what nutrients are lost, and how much, before it reaches the table. The first question this study will answer is whether or not the food needs restoration at all.

Restoration with Natural Substances

If the need for fortification or restoration is indicated, several new questions will arise. One must look for a concentrate that contains the factor or factors, and a method for incorporating it into the product.

If loss of fat soluble vitamins A and D is indicated, fish liver oils, irradiated ergosterol, or irradiated yeast and carotene, should be considered. If B complex vitamins have been lost, concentrates to be considered are: Yeast and yeast extracts, liver and liver extracts, defatted cereal germ, rice bran concentrates, and concentrates from certain fermentations.

If vitamin C has been lost, it may be cheaper and just as satisfactory to use synthetic ascorbic acid. Vitamin P, which is found together with vitamin C in citrus fruits, and has important physiological activities different from vitamin C alone, could be advantageously added also.

The original study may show a loss of high-quality protein that had the effect of supplementing poor protein left in the product. Sources of this high quality protein which should be considered are: Yeast, liver, soya flour, peanut flour, dry skimmilk or dried egg.

For many years, consumers have been importuned with the value of foods made from whole wheat. But whole wheat flour is a product that keeps poorly. When white flour is made from it, the germ and bran are removed leaving only the endosperm.

It is interesting to note that when 1 percent of yeast is added to white flour, approximately 0.5 percent of protein is added, whereas 1½ percent of wheat germ is required to supply 0.45 percent of protein. And the addition of 1 percent of yeast gives a product that contains some of the less-known factors of the B complex vitamins in amounts that are similar to white flour with the germ restored, (see Table I).

Thus yeast, in the amount of 1 percent, supplies both B complex vitamins and protein as these would be found in a true whole wheat flour minus only the brain. On the basis of quality, the yeast protein compares favorably with wheat germ protein as shown in Table II.

If high quality proteins are available, but in small amounts, it may be advisable to add to the product lower grade proteins. In this way the total amount of protein can sometimes be increased and the total protein still remain of acceptable quality. Sources of these proteins may be wheat or

* For a more complete discussion of the legal aspect of fortification see "Nutritional Improvement Presents Many Legal Problems," Food Industries, December, 1948, and "Nutritional Improvement Challenges Processors," Food Industries, September, 1948.

corn. They are found on the market as gluten and zein, respectively.

Incorporating Materials

Having calculated how much of any one of these substances is needed, experiments should be set up to find a method of incorporating the concentrate into the food. This may be done by mixing if the food is of such a nature or condition that it can be mixed. Sometimes it is possible to sprinkle or spray fortifying material on the outside of a solid particle.

Next comes evaluation of taste, texture and acceptance of experimentally restored foods. If the taste and texture are changed, the experiment is usually not considered to be a success. Further experiments should be made, compromising with the goal in view by reducing the amount of restoration. Or restoring materials from different sources may be tried. Food manufacturers should be alert to the possibility that new or improved flavors can develop from these procedures.

Stability of Restored Foods

When a product is developed that is satisfactory as far as taste and texture are concerned, consideration should be given to its stability, and particularly to the restoration that has been accomplished. Assays should be made on the unrestored and restored food and on the restoring material. If there is a record of the amount of restoring material and the yield of restored food, simple calculations will make clear what losses if any were due to processing.

If the assays show not more than nominal losses, then the experiment should be considered a success thus far. Aging tests, dependent on the shelf-life expected for the food, should then be made. It is important that quantities of vitamins to be declared on the label actually be present in the declared amounts. If the amounts are not to be declared, a statement as to the identity and amount of the restoring material is often sufficient. Food manufacturers would do well to be alert to finding an increased shelf-life as far as rancidity and texture are concerned, although this by no means will be the usual result.

Cost of Restoration

Because an investigator cannot determine the value of a product he will develop, it is impossible for him to make more than a rough estimate of the cost. Although fortifying with synthetic vitamins will generally be cheaper, the nutritional improvement resulting from natural substances will usually be greater. And this improvement is of such a nature that it could not be duplicated by any amount of synthetic vitamins. In addition, there is always a chance of a new and improved flavor or improved stability resulting from natural substances which may not be obtained from synthetic materials.

Natural Restoration Not New

Restoration with natural substances is not a new procedure. Milk has been fortified with vitamin D for some years. Oleomargarine is enriched with vitamin A, and the standards allow for optional addition of vitamin D. It is an established custom for certain bakers to add milk to their bread. The amount of enrichment that will be allowed for bread will depend on the outcome of hearings now being held in Washington.

Another instance that is much newer, is the fortification now practiced in the preparation of enriched alimentary pastes. The standards for enrichment of these pastes prescribe the addition of certain amounts of thiamine, riboflavin, niacin, iron. The vitamins may be added in whole, or in part, as dried yeast or defatted wheat germ. Addition of calcium and vitamin D is optional.

The amounts of thiamine, riboflavin, niacin and iron to be added were arrived at by determining the amounts present in unenriched pastes, the requirements of that portion of the public who eat mostly macaroni, and the losses of these factors incurred during preparation for the table. As this is a standardized food, all of these decisions were made by the F&DA after hearings were held. At these hearings it was disclosed that up to 2 percent of dried yeast could be added to alimentary pastes without appreciable changes in taste or texture of the cooked product.

Enrichment can be accomplished by using a prepared premix. This premix supplies thiamine, riboflavin, niacin and iron in the amounts prescribed for enriched alimentary pastes. It also supplies vitamin D in an amount that will meet the optional requirement. All of this is supplied by using dried yeast as a carrier. The premix should be added in an amount equivalent to 1 percent of the semolina to be used. For batch manufacture, it is supplied in packages containing 1.4 lb. This supplies the materials needed to enrich 140 lb. of alimentary paste. The premix is also supplied in bulk suitable for metering into continuous mixers.

Except for the addition of the premix at the beginning of the mixing operation, there is no change in the commonly used manufacturing process. The final product contains, in addition to the prescribed vitamins, ½ percent of high quality protein and small amounts of other vitamins and growth factors.

Methods have been worked out also for the enrichment of candy bars, potato chips and soda crackers, all using natural substances. Many cereal products have been fortified with minerals in addition to synthetic vitamins. Canned foods in general would be good subjects for restoration if it were not for the official standards which have already been elaborated. If the consideration of restoration of acid fruit and vegetable juices, and jams and jellies ever become warranted, both vitamin C and vitamin P should be given attention.

A group of canned foods that are not standardized are canned meats. It may be possible for a meat canner to prepare meats with vitamin contents of such a nature that the meat which has undergone one preparation in the factory, and another in the home, can arrive on the table with all of the vitamins originally present in the fresh meat.

Philosophy of Processed Food Restoration

When fortification of processed foods becomes necessary, it should be approached with the following objects in view:

1. To restore qualitatively to selected processed foods all of the substances lost because of cooking, milling or chemical change. These include, as far as possible, the unknown, and little known, factors as well as the well known factors.

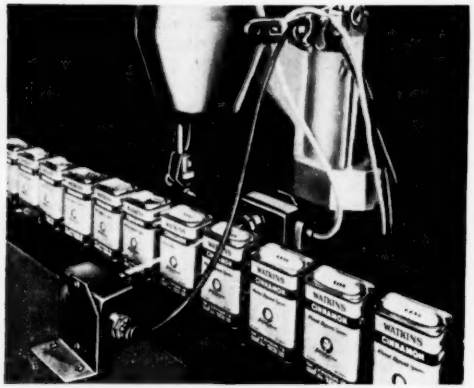
2. To restore a sufficient quantity of the lost factors so the food, when prepared for the table, will contain the same amount of these factors as the raw materials from which they were made. The factors recognized by the F&DA must be considered. These are the vitamins A, D, thiamine, riboflavin, niacin and ascorbic acid, and the minerals calcium, phosphorus, iron and iodine. In unstandardized food, it is sometimes worth while to relate the levels of these factors in some way to the requirements suggested by the Food and Nutrition Board.

3. To restore vitamins and supplementing proteins to selected foods that are deficient so that if the time of utilization is important the consumer will be protected.

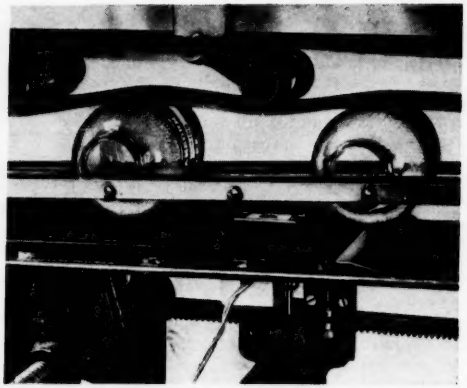
4. To restore certain factors to a number of selected foods so that individuals who have a liking for certain foods, or individuals who are forced to live on a restricted diet, will be protected.

5. To add only those vitamins that are naturally or chemically associated with the food being restored.

CODE MARKERS IN ACTION—On containers . . .

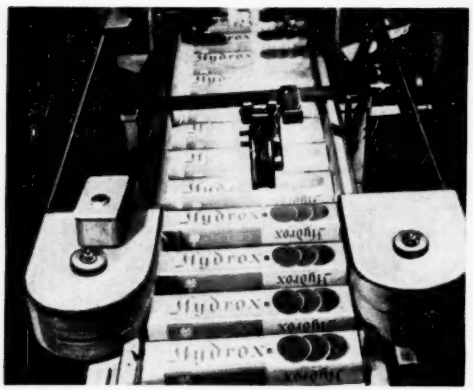


PLUNGER-TYPE CODER, electronically controlled, imprints canister covers on driven-belt conveyor.

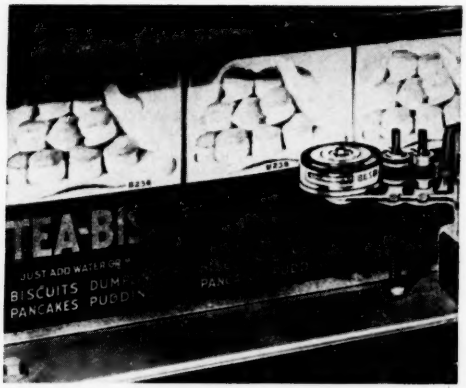


JAR CODER, seen here mounted on rubber roll-off bed of wrap-around labeler, marks code-dates on the labels.

. . . on packages . . .

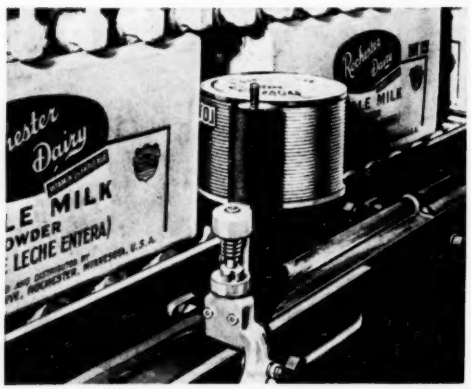


COOKIE PACKAGE is imprinted with single letter by rotary coder in compression section of overwrap machine.

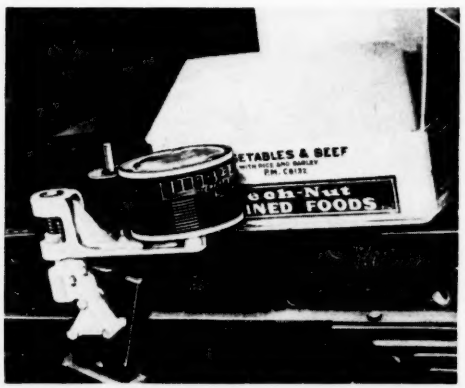


BISCUIT MIX PACKAGE is coded with letter and three numerals in compression section of filling and sealing unit.

. . . and on shipping cases



SHIPPING CASES get automatic marking as a part of existing operation at compression section of case-sealer.



ROTARY CODER imprints whole legend on standard shipping containers as they travel along a driven-belt conveyor.

Code-Dating Provides Simple, Effective Protection

Factors in developing a coding system . . . how to determine the type of mark and its location . . . selecting the right machine

IRA GOTTSCHO
Adolph Gottscho, Inc., New York City

A new sales manager for a baking company discovered that return of stale goods and complaints from consumers and retailers were excessive. This condition was both unhealthy and expensive. Company sales were suffering.

When this sales manager learned that the production manager had been thinking of code-dating, he approached him about it. Together, they prepared a strong brief for coding, got it approved by top-management, and put it into operation—and in a few short months the system had augmented sales and lowered figures on returns and complaints.

Reason for this success was that the code-dating system enabled the grocer and company salesman to advance older stock to a front position on the shelves and also to measure sales turnover and to control inventories more accurately.

Two other cases further bear out the value of such code-marking. In one case, a milling company was sued for $50,000 by a consumer who contended he was poisoned by a package of flour which, he claimed, contained arsenic. This package and the remaining contents were offered in evidence as Exhibit A to substantiate the claimant's plea.

However, the miller won hands down because he was adequately insured—by code-dating. He was able to produce other packages of his product bearing the same code-date as the allegedly adulterated package. These packages were obtained from grocer's shelves. Furthermore, the flour in these packages was found to be free of arsenic. And since the code-date also identified all the company's personnel involved in the processing and the packaging of the box in question, these employees were able to testify in the company's defense.

In the other case, a canner of fruit juice—after spot-checking his product before final packing—discovered that samples from several lots were unfit for consumption because they contained flakes of can enamel. He was quickly able to segregate the offending lots and trace the trouble to a new supply of cans by their code-marks—thus saving the expense of destroying, unnecessarily, the many lots of unaffected juice.

These typical cases reflect today's need for code-dating as a vital form of business insurance. Actually, *all* foods are basically identified in some way on their packages. But this is not enough. Identification, essential as it is, represents only a part of code-dating's overall function.

Advantages of the System

Code-dating is primarily a means of implementing a quality control program—and such a program is practically a "must" for small as well as large food processors.

Proper code-marking of food products enables a processor to halt shipment of goods that do not measure up to established standards of quality. Or, if evidence of bad batches or defective containers turns up after goods are on the market, it is a simple matter to recall them. Also, if defective goods are returned, it is possible to trace the origin of all the raw materials used in the product, as well as to check back on the machines and personnel involved in its preparation or packaging. Thus, in the event of questionable purity or quality, the code-mark quickly identifies batch, plant, department, machine, operator, and suppliers of raw materials and containers.

In this connection, there is some psychological advantage in using a code-mark to identify personnel. When every package bears the signature—in code—of the packer or machine operator, it is likely that the employee will develop a greater sense of responsibility.

Sales control and competitive advantage rank next in the importance to a good code-dating system. The code-mark is the key to selling older goods first, and to returning those goods that may have deteriorated or lost their freshness.

When a woman buys a biscuit mix that doesn't turn out well, or a jar of mayonnaise that is off-flavor, she doesn't necessarily complain or return the merchandise.

She simply makes a mental note of her experience and avoids the brand in the future. Perhaps she spreads the news to her friends and neighbors. Thus, efforts of the sales and advertising departments are nullified because old, stale goods fell into the hands of a consumer.

A code-date on foods, however, helps the salesman and retailer to follow a logical policy of "first made, first sold," thus removing a prime source of consumer dissatisfaction. This is equally applicable to the controlled movement of stock out of factory, warehouse and stockroom, particularly at a time when products move slowly.

The competitive advantage of code-dating can be realized when the consumer recognizes that a code-mark on a package is visible evidence that the maker has taken steps to guard the quality of his product. Codes are, in effect, a badge of merit that establish consumer confidence.

Finally, code-marking contributes to efficiencies in handling—from manufacturer to distributor to retailer. It constantly aids in quick identification of case contents and special lots that may be intended for specific destinations or types of outlets.

Thus, shipments can be assembled and routed with maximum speed and accuracy. And goods can be more readily identified while in storage. Also, a margin of safety is assured by coding opaque food containers to identify their contents prior to applying labels on overwraps.

Picking the Purpose

Before establishing a method of code-dating, the processor should decide what he wants his coding to do. Is it primarily for purposes of quality control? Or sales control?

The nature of the product and how it is processed will largely govern the selection. For instance, if the package is salt, sugar, or some similar stable product, it may call for a code that simply indicates the date of packaging or the plant. On the other hand, if it is packed fruits or vegetables, the code may be employed to indicate the original lot of raw materials used in the particular batch, the lot of containers used, and perhaps even the

Product coding can give quick check-back on—

- **Contents, sources, grade**
- **Batch and date of packing**
- **Sources of containers**
- **Plant and machine**
- **Operator or packer**
- **Destination and date for withdrawal**

time the packing was done. Perhaps, too, the identity of the particular machine or operator.

Depending on the size and nature of the operation, some or all of this information may be designated with a single code reference. For example, if one packer puts up only one batch every day, the date of packing will be an adequate code. Your production records for that date, however, would then reveal the source of the raw materials and containers used on that day's batch, and any other data.

But, if several batches a day are put up, drawing on different lots of materials and packages, and with changes in processing, a code may be used that indicates each variation.

Factors in Setting up Codes

When the purpose of the code is fully determined, then there may be considered such factors as: How often must the code be changed? How many characters must it contain? Should it be a secret code or an open, readily comprehensible code? Should the mark be visible or concealed? For whose use is the code primarily intended—production department, sales department, retailer, or consumer? What is the normal life of the product—in the warehouse, on the shelf?

Perhaps there will be a need for more than one code-mark, one for each type of package—the primary package, display carton, and shipping case. The product's basic container may bear a code that indicates the batch and date of packing. The display carton may have a code revealing the packers. And the shipping case may show the contents, pack, and lot number.

Whether it is better to have open or secret codes is a common question. The choice is important in preliminary planning. A fairly safe rule is to use a secret code, unless there is a good reason why consumers must understand your code. Also, short shelf-life products—unless otherwise dictated by law or common custom, as in the case of milk—should generally bear secret codes. If open codes are used, and conspicuously so, shoppers will inevitably tend to purchase the packages with the most recent date, thus contributing to a higher rate of returns on stale goods.

Secret codes must be planned in accordance with the frequency of change and likelihood of repetition at some future date. Let us assume, for instance, that the coding requirements are simply for the date of packing—and, for particular reasons, it is desired that this be a secret code.

Obviously, neither "July 7, 1949" nor "7-7-49" are acceptable. Nor is "7749" satisfactory. For, though slightly more secretive, it is susceptible to error and confusion. When the day or month must be indicated with two digits instead of one, such a code runs into trouble. November 7, 1949 would become "11749." And no one would know whether this meant the seventeenth day of January or the seventh of November.

Zeros might be used to keep such a code on an even keel of six characters—i.e., by preceding the one-digit day and month designations with a zero. Thus, July 7, 1949 would be coded as "070749." But this involves six characters for the date alone, with any further identification—regarding batch, plant, and packer—necessitating the use of still more.

Numerical and Alphabetical Codes

Perhaps the numerical code is most common, with the year indicated by its last digit and the day by its numerical place in the year. For instance, October 8, 1949 would be coded as "9281"—the first number representing "1949" and the "281" representing "October 8", the 281st day of the year. January 1, of course, would be the first day of the year and would be coded as 9001.

If there is a likelihood that a product may remain out for more than ten years, different decades may be identified by using different color inks. Or, the year may be more specifically represented with two digits—"49." However, most food processors consider the single digit adequate for their purposes.

Another method is to use the first 12 letters of the alphabet to represent months of the year, excluding the letter "I" because of possible confusion with the numeral "1". Ordinarily, it is also advisable to omit the letter "O" because of its confusion with the "0" for zero.

Thus October 8, 1949 would be coded as "9K8"—the first number for 1949, the "K" for October and the "8" for the eighth day of the month.

A popular code is a reversal of straight numerical date representations. Thus, "10-08-49" (October 8, 1949) would be reversed to read "948001." In all straight numerical codes, it is important to use two digits for all date designations, i.e., "1" should always be represented as "01".

When a code for month and year only is sufficient for a food processor, a straight alphabetical code is frequently used. This code is based on some key phrase of twelve unduplicated letters. For instance, a phrase like "BEST IN FLAVOR" would be coded as follows:

B	E	S	T	I	N	F	L	A	V	O	R
1	2	3	4	5	6	7	8	9	10	11	12

Now to code "May 1949," the date would first be converted to the numerals "5-49", then the numerals substituted by their respective letters in the key phrase—to arrive at "ITA" as the code mark.

This system may also be used to include the specific day — represented numerically, while month and year are represented alphabetically. May 7, 1949 would thus become "I7TA". In this type of code, where the day is the only part of the date shown numerically, it is not necessary to precede one-digit days by a zero. And, since the first letter always represents the month and the last two letters the year, the letters "O" and "I" may be safely employed. This particular code is a good one, but it cannot be used in 1950 because it makes no provision for coding the numeral "O".

The straight alphabet is also commonly used as a basis for codes, with each of the letters "A to Z" representing two-week periods of the year. Or, if weekly coding is necessary, the first 26 weeks of the year are indicated by single letters and the second 26 weeks by double letters. Thus, the first week of the year (fiscal or calendar, according to preference) is shown by the letter "A", while the 27th week is shown by "A", and the 52nd by "ZZ".

Specific days of the week can also be indicated with either of these methods. If the alphabetical designation is used on the two-week basis—i.e., "A" stands for the first two weeks of January, each of the ten working days within a two-week period can be designated by numerals "1 to 0". Or, if the one-week periods are indicated by either a single or double letter, the numerals "1 to 6" can be used to show days of the week.

The latter is preferable, of course, where 5-day weeks are not the rule. October 7 is a Friday ("5") and falls within the 40th week of the year ("NN"). This code also permits unconfusing use of "O" and "I".

Products with short shelf-life (less than a month) are usually coded to enable inspectors, salesmen or store-

keepers to withdraw merchandise from sale on dates designated by codes.

Many packers with good merchandise-withdrawal control find that a designation of the numerical day of the month on which goods should be withdrawn if unsold serves their purpose very well. For instance, a product with a shelf-life of two weeks will be coded simply with the numerals "22", if packed on the 8th of the month. Daily checks of these products assure that those bearing "22" will be picked up on the 22nd of the month.

A pre-packager of meat codes his products simply with a single numeral, Monday being represented by "1", Tuesday by "2", etc., together with a code letter to identify the packer. At the close of Tuesday's business, all merchandise bearing the code "1" (indicating it was packed on Monday) is withdrawn from sale.

Altering Codes to Suit Needs

These coding systems are only a few of the many successfully in use today. They can be altered to suit particular needs. Machine operators or packing personnel can be identified by adding the employee's clock number or an assigned alphabetical letter to the date-code. Morning or afternoon packs, or day and night shifts, can also be indicated with the letters "A" and "B", or any other designation that will fit the rest of the code without confusing it. Plants, machines, batches, or other desired information on the product, also can be designated by incorporating additional elements into your code.

After settling on the code-marks, there comes selection of a method of applying them. But first, there are several basic requirements: The mark must be: (1) Legible (code is useless if it cannot be decoded), (2) permanent (must not fade or rub off), (3) readily visible*, (4) on part of the package not likely to be discarded (caps of jars, for instance, may be disposed of while the jar is retained in use), and (5) located in the same position on all identical containers (so that it may be found quickly.)

It is naturally desirable to accomplish the marking as economically as possible. Fortunately for processors, the recognition of code-dating as an essential function has resulted in the specialization of marking engineers—men who devote themselves to making the operation as efficient as possible. And, since processors and packers often have special problems, the mechanical method that will work best may sometimes have to be specially engineered to conform to the needs of the product, container, and packaging method. In short, the function of the marking engineer is to integrate the marking operation, as far as possible, with some other already existing and necessary production operation.

Machine Coding Inexpensive

Coding used to be done manually with a rubber stamp. But except where very small quantities are involved, this method involves unnecessarily high labor costs. On the other hand, when marking is performed automatically during a filling, labeling, packaging, or case-sealing operation, no cost is incurred for personnel.

Mechanizing the application of the mark always results in labor cost reduction if the quantity of production requires the use of any mechanical packaging machines. Our company files are full of case histories of companies which have replaced $2,000-a-year personnel with marking machines that cost as little as $100. One large package-goods company has saved $65,000 a year since it replaced combined manual and semi-automatic marking with fully automatic equipment. It paid for itself in two months!

Sometimes, the integration of the marking operation with some other operation is not feasible. This is true, for instance, in the case of very small labels requiring very small marks. It is also true in the case of irregular packages using "headers" or "saddles" as closures, such as bags for cookies and other bulk items. But even here the marking engineer is concerned with methods of pre-marking or pre-dating labels, headers, etc., at lowest possible cost by independent automatic imprinting machines.

Many marking requirements can be filled quite simply by attaching one of the various kinds of friction-operated, rotary marking machines to a packaging machine, filler, conveyor, or case-sealer. Machines of this kind use interchangeable rubber type which is re-inked automatically by an ink roller that requires infrequent re-filling. Rotary code-marking machines like these are also used for marking contents, trademarks, grades, etc., as well as codes, and can use inks of different colors especially made for different surfaces. Such machines are used to mark both small and large containers of almost any shape.

Types of Code-Dating Machines

Small thermal units with electrically heated, interchangeable steel type have recently been introduced. These units imprint a semi-perforating mark on jar, can, and bottle labels during wrap-around labeling operations, or on paper cups and containers as they are rolled over the unit.

Imprinting of inked marks on flat labels after they are impressed on bottles, cans, and jars, can be performed with a machine that takes its drive from the holders or pushers on the line to which it is geared.

Embossing and debossing of can covers is performed on machines installed to feed the marked covers to the line just prior to the lidding or capping operations.

A high-speed machine that effects precise spot-marking and positive synchronization with product flow through electronic controls is also widely used for code-dating. This machine marks small and large products with either inked or "blind" (indented) impressions as they move along a line. The machine is actuated by an electric eye, consequently registers its mark in the same spot on all objects passing by it, regardless of the spacing between them.

Some packaging machines may also be obtained with marking attachments designed especially for the particular machine. Some of these are now able to produce marks of a quality that compare favorably with letter-press printing.

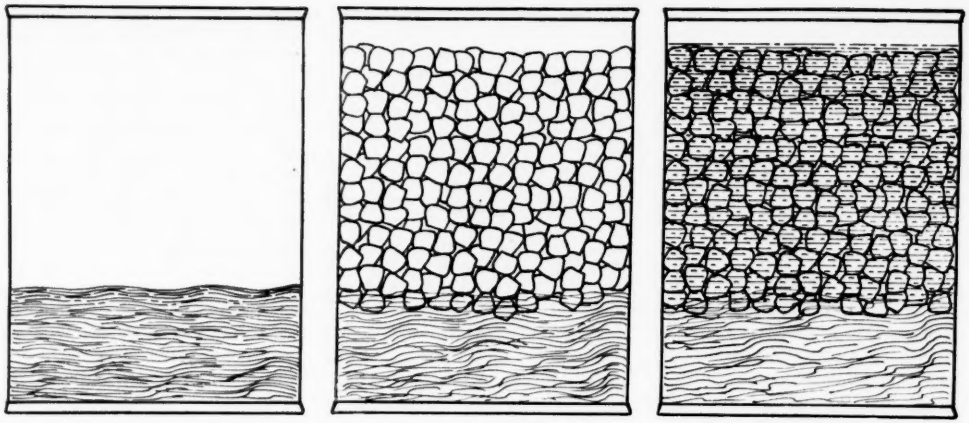
Recently, efficient package-marking machines have been developed that fit into lines where there are cappers, fillers, labellers, cartoners, and sealers. These new machines function alongside other standard packaging machines, to match their production rates, to perform as long and dependably as these packaging machines, to adjust to different packages, and to imprint clear, permanent marks automatically as the products travel the production line.

When integration of the marking with another production operation is impractical or undesirable, and code-marks or product identification must be pre-marked on labels, cards, headers or cartons, the food processor can still choose from many machines. Standard marking machines, or special machines incorporating certain basic principles, are available today for marking all kinds of food products—their primary packages or shipping containers—at costs far lower than old-fashioned rubber stamping methods. Some of these are for perforating, some for imprinting, and some for indenting.

Careful study of available machines in relation to particular needs—as dictated by type of product, package, mark, surface, area to be marked, and production rates required—will suggest the most appropriate machine to do the job best and most economically.

*Whether or not the mark is for the consumer's benefit will determine whether or not it should be conspicuous. However, if the code is hidden—say, under a label,—it cannot be read without removing the label. If an inconspicuous code-mark is desired, it may be spotted on the bottom of the package. There, it will be visible without being obvious.

Special Method of Filling Cremogevac Corn into Cans

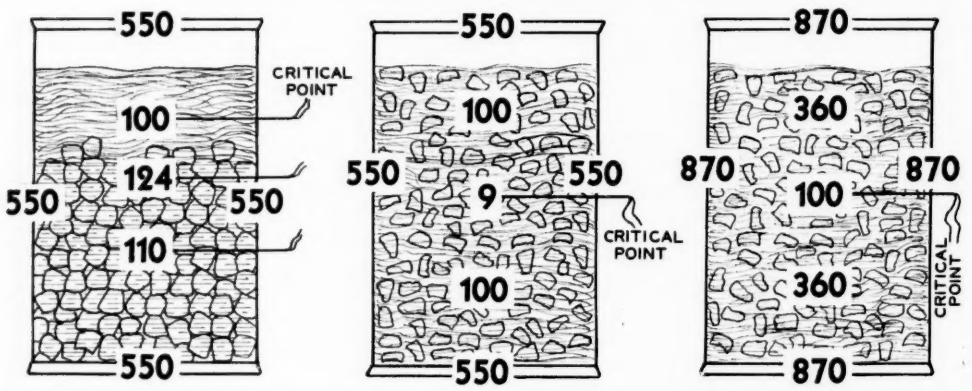


1 First, concentrated cream component is filled into can.

2 Then kernels are put into can on top of cream component.

3 Next, brine is added, filling space around kernels.

The Corn is Sterilized Much Quicker Than Premixed Cream Style



A Cremogevac Corn in No. 1 can is sterilized in 33 min. at 250 deg. Numerals indicate percent of lethal heat reaching different points.

B When premixed cream style corn in No. 1 can is processed 33 min. at 250 deg. F., only 9 percent of lethal heat has reached center of can.

C Processing premixed cream corn in No. 1 can for 52 min. at 250 deg. F. brings center to 100 percent lethal heat, overprocessing other parts.

New Technic Speeds Sterilizing of Canned Corn

Transfer of heat by convection achieved in Cremogevac corn by keeping cream component separate from kernels and brine during processing*

OLIN BALL
Director of Research, The United Products Co., Westminster, Md.

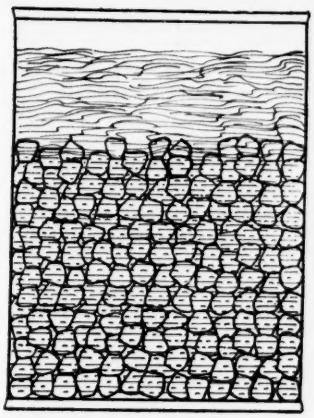
From the work done on Cremogenized cream style corn has come a new technic in sterilizing corn. Perfected by the Research Laboratory of The United Products Co., the technic is embodied in the Cremogevac process.

Cremogevac corn is made of corn kernels, corn cream component and brine. In its final form, it resembles Cremogenized cream style corn in appearance, except that it contains almost as high a proportion of kernels as does whole kernel corn.

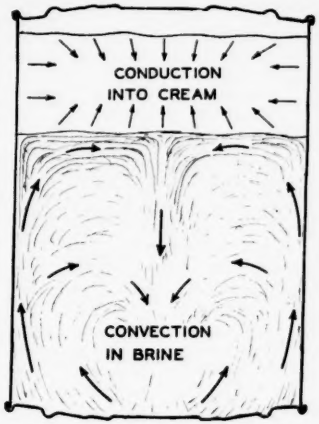
This new canned corn has a distinctive feature. It is so prepared that it can be sterilized in a process which is only slightly more severe than that required for whole kernel corn. As every corn canner knows, the whole kernel corn process produces less heat effect upon the quality of the product than does the cream style corn process.

From TUPCO Lab. Bull. No. 1.

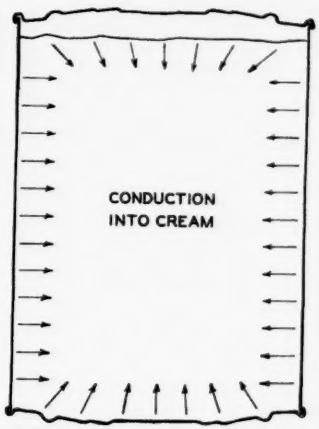
to Shorten Heat Sterilization and Cut Process Time



4 And sealed can is inverted for processing (desirable but not necessary).

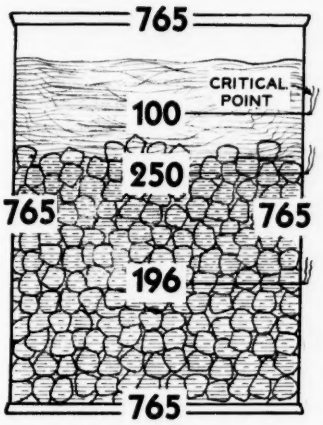


5 Heat flows into product by convection and conduction.

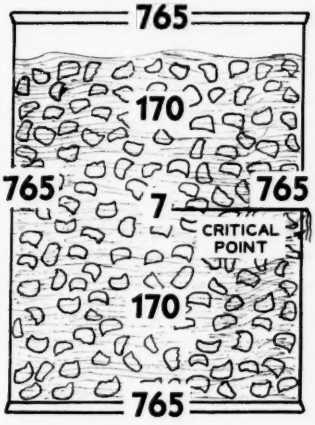


6 But in premixed cream corn there is no convection.

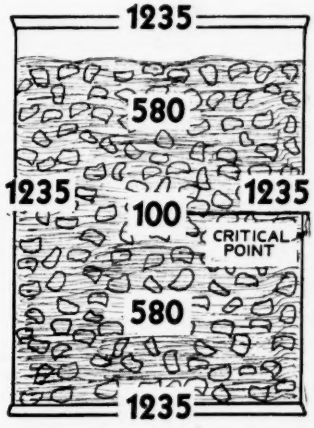
and Overprocessing of Product is Reduced Greatly



D In No. 2 cans, Cremogevac corn is sterilized in 46 min. at 250 deg. F. Numerals indicate percent of lethal heat reaching different points.



E But after 46 min. at 250 deg. F., only 7 percent of lethal heat has reached center of No. 2 can of premixed cream style corn.



F So it takes 74 min. at 250 deg. F. to bring center of premixed cream style corn to 100 percent lethal heat, overprocessing other parts.

The lower process is made possible by maintaining, during sterilization, an arrangement of the product in the container which permits heat to flow into the corn at a much higher rate than it flows into premixed cream style corn.

This is accomplished by keeping the concentrated cream component, consisting of comminuted whole corn kernels, separated from the whole kernels and brine in the container until after the sterilization is accomplished. Then the cream component may be mixed with the brine and kernels, either by shaking the sealed container or by stirring after the container is opened.

Packing and Sterilizing

The three components—cream, kernels and brine—are put into the container separately. Or at least the cream is put in separately from the kernels and brine, since the latter two components may be filled simultaneously (diagrams 1 to 4). Then sterilization is carried out while the cream is kept stratified in a layer separate from the kernels and brine in the container.

The kernels and sections of kernels occupy more than half of the volume of the can, and the interstices may be filled with brine or may be nearly devoid of liquid as in the case of vacuum-packed whole kernel corn. An advantageous arrangement during sterilization is to have the concentrated cream layer above and resting upon the kernels. The cream layer may be in the bottom or in both top

and bottom of the container. And the container may be either standing on end or resting on its side during the sterilization process. These differences in conditions make necessary some slight variations of the process.

The preferred method of packing is to put a measured quantity of the concentrated cream component into the container first, then a measured quantity of kernels and a measured quantity of brine. Any or all may be at room temperature or at a higher temperature. If the mean temperature of the three components is not high enough to provide a normal vacuum in the container, or if the amount of brine used is insufficient to fill the interstices among the kernels, the container is sealed under vacuum. Immediately after sealing, the container is inverted and, if the processing is done in a still retort, the container preferably should rest in this inverted position during the sterilizing process.

What Happens in the Can

During the application of heat to the container, the temperature rises rapidly within the mass of kernels, just as it does in whole kernel corn, because the heat is carried to the center of the can by convection currents in the brine. Consequently, the temperature also rises quite rapidly at the lower face of the layer of concentrated, finely divided component (diagrams 5 and 6).

While the rate of heat conduction within the cream is low, it does not take long for the heat to reach the center of the layer because: (1) The layer is comparatively thin and (2) the temperature rises rapidly at all faces of the layer of cream. The interior of the cream layer is the last point in the container to receive sufficient heat to accomplish sterilization.

TABLE I—EQUIVALENT PROCESSES of Cremogevac and Premixed Cream Style Corn at 250 Deg. F. ($F_o = 6$)

Initial temp.	Can	Cremogevac (min.)	Cream (min.)
150	No. 1	33	52
	No. 2 Vac.	41	66
	No. 303	42	67
	No. 2 Stan.	46	74
70	No. 1	39	
	No. 2 Vac.	49	
	No. 303	50	
	No. 2 Stan.	55	
180	No. 1	30	46
	No. 2 Vac.	37	58
	No. 303	38	59
	No. 2 Stan.	41	64

Heat Transfer Principle

In this process, effective use is made of the principle that, in products through which heat passes by means of conduction, the rate of flow of heat is affected very little, if at all, by a wide variation in moisture content.

By delaying (1) the mixing of water with concentrated finely divided material, and (2) the dispersion of the finely divided material into the interstices of the discrete particles until after sterilization has been completed, the canner can sterilize his product in approximately 60 percent of the time that would be required if the sauce were mixed prior to sterilization.

Lethal Heat Patterns

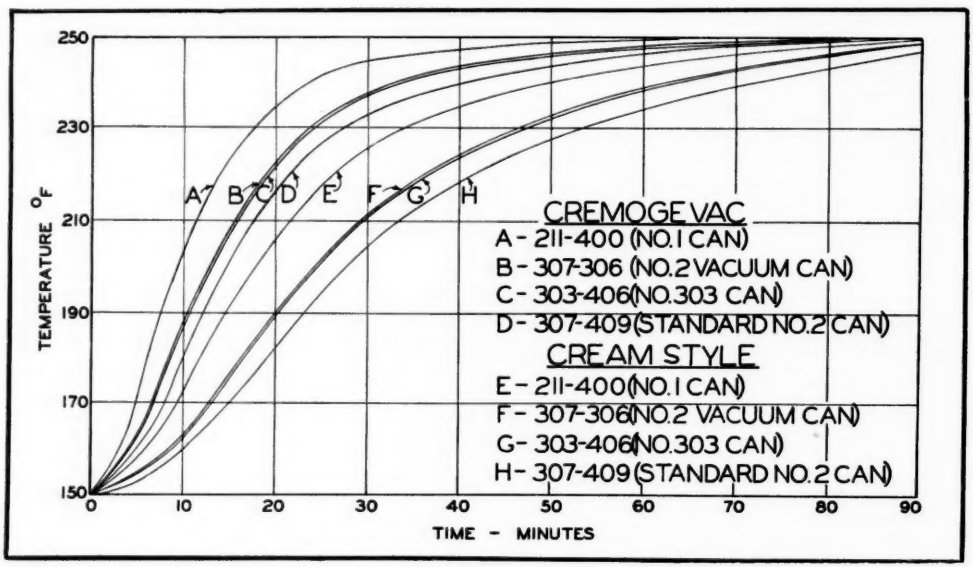
The relationship between Cremogevac corn and premixed cream style corn in respect to sterilizing values is shown in diagrams A to F. These indicate what part of the lethal heat —which is necessary to sterilize the corn—reaches the critical points in cans of Cremogevac and cans of premixed cream style corn during different processes.

It is apparent that, in sterilizing processes at 250 deg. F., premixed cream style corn is much more severely heated than is Cremogevac corn. The same is true at temperatures other than 250 deg. F., although not exactly the same ratios prevail at other temperatures. The values give a fairly accurate indication also of the amount of destruction of organoleptic and nutritive qualities which is caused by the heat of the processes.

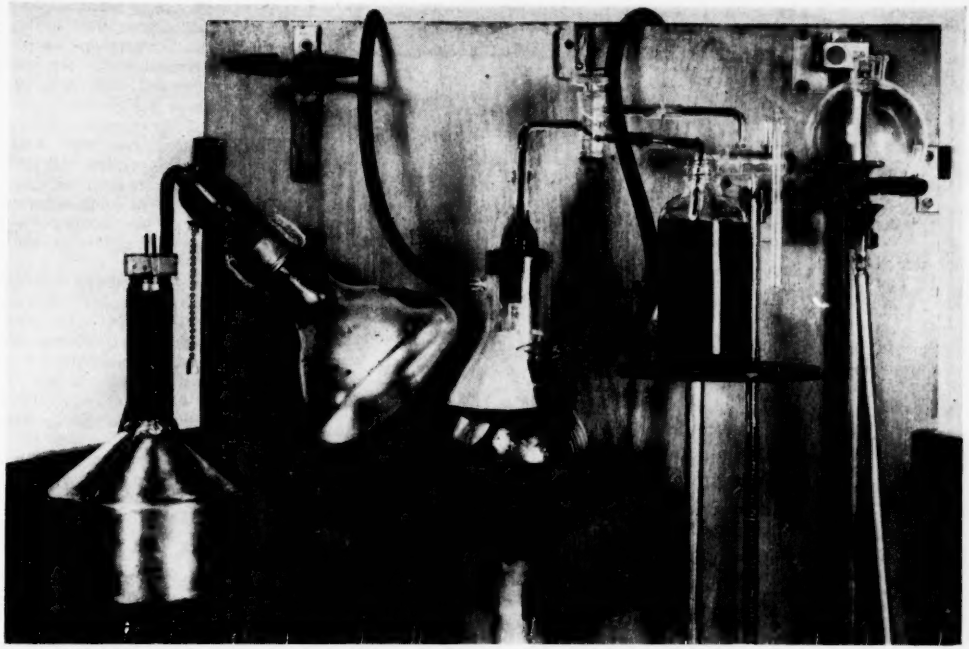
Diagrams A to F, of course, are based upon heat penetration data. Comparative heat penetration curves for four sizes of cans of Cremogevac corn and four of premixed cream style corn in still process are shown in the chart. Equivalent processes for the various cans of the two types of pack are listed in Table I.

For gallon cans, the new technic saves 60 percent in sterilizing time and avoids the 3080 percent overcook

(*Turn to page* 208)



RAPID heat penetration into Cremogevac corn, as compared with premixed cream style corn, is shown by curves.



NEW GAS ANALYZER works precisely. The samples are rapidly desorbed in bulb (center, under infra-red lamp).

Gasometry—For "Sharper" Control of Food Quality

New method accurately evaluates dissolved, occluded, and headspace gases, and can be used in improving products processed and packed with inert gases

A. L. BAYES, E. R. FLOOK, and G. B. GRAHAM
Laboratory of The Linde Air Products Co., Tonawanda, N. Y.

Rapid and accurate analysis of dissolved and headspace gases in certain food products is now possible by a modified gasometric method.

Reason for devising this procedure was to obtain reliable evaluations of: (A) Food processes conducted in protective, inert atmospheres, and (B) the foods themselves, packaged with inert gases.

This new method has been satisfactorily used for the analysis of dissolved gases in apple juice, orange juice, grapefruit juice, tomato juice, whole and evaporated milk, edible oils, and mayonnaise. It has also been employed to analyze headspace compositions of many food products packaged in tin, glass, and transparent-film containers.

The development of the analytical method and instruments described here, is a specific phase of the broad work being done in conjunction with the food technology program at the laboratory of The Linde Air Products Co.

Search for a method of analyzing dissolved gases came first. A special, portable gasometric apparatus was designed—one that could be adopted for general use in field and research operations. Later, a two-chamber gas evacuation system was built, improving upon the single-reservoir system.

The procedure involves desorption of gases from liquid and semi-liquid products by reduced heat and pressures. Then the desorbed gas mixtures are analyzed by standard Orsat procedures.

Next came the development of a method for analyzing headspace gases in tin or glass containers. These gases can now be analyzed by means of a specially designed sampler that can be attached to the portable unit.

Finally, a method was devised for analyzing headspace and occluded gases, as in spray-dried whole milk.

After a thorough survey of the literature in search of suitable methods of determining dissolved oxygen in liquids, the authors considered the gasometric method best because: (1) Variations in chemical composition of products have no effect on analysis of dissolved gases; (2) complete analysis of gas mixtures may be obtained, (3) the method is direct and requires no calibration, and (4) equipment may be used to determine headspace gases as well as dissolved gases.

An apparatus was constructed according to directions given by Loeffler*. Then, using water saturated with air under known conditions of

* H. J. Loeffler, *Ind. and Eng. Chem., Anal. Ed.*, Vol. 12, p. 533-534, 1940.

Details of Devices for Analyzing the Gases

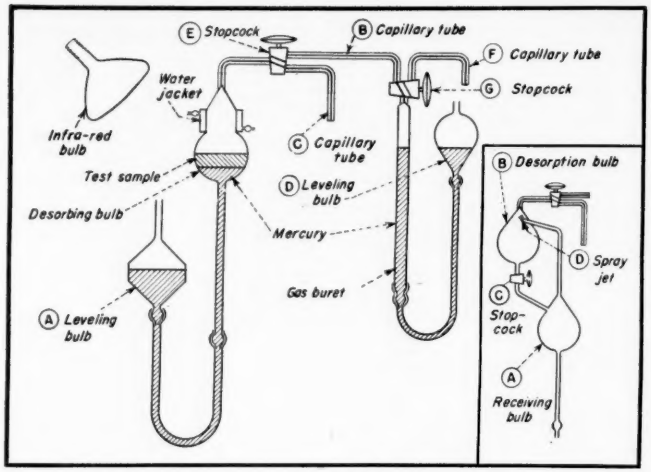


FIG. 1. COMPONENTS of gasometer. Inset: New two-chamber desorber.

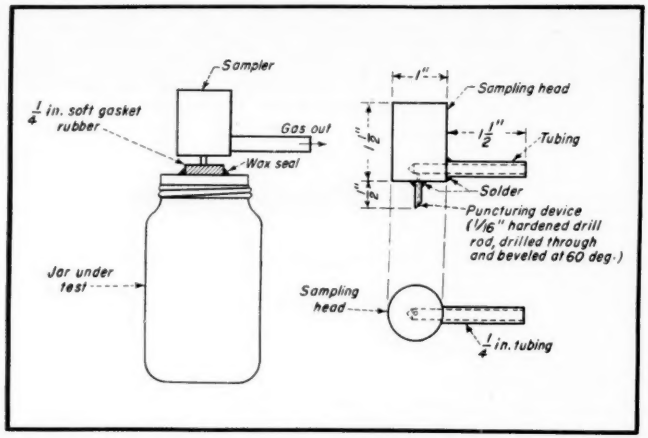


FIG. 2. HEADSPACE sampler. It removes gases from canned products.

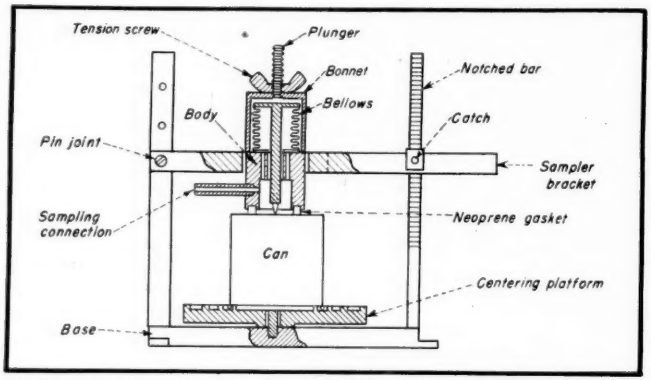


FIG. 3. CLOSEUP of device which pierces cans to draw off samples.

temperature and pressure, experimental determinations were made to investigate the accuracy and performance of the method itself. The results pointed to several difficulties, indicating the need for modifications in the design of the original apparatus. Difficulties encountered were leakage of air into the apparatus, and length of time required for complete deaeration of samples. These difficulties were surmounted and the outcome was a modified gasometric apparatus (shown in photo).

Tests were next made to determine the accuracy of the new apparatus. Samples of freshly distilled water were saturated with air at different temperatures, and then analyzed for dissolved oxygen content. It was possible to ascertain the theoretical amounts of dissolved oxygen by means of known temperature and known pressure during aeration.

Results of these tests (Table I) show close agreement between observed and expected dissolved-oxygen values. This indicates that deaeration of the sample is complete and that consistent errors which may exist are sufficiently small, thus permitting attainment of reliable and precise results.

Measuring Dissolved-Gas Content

In operating the apparatus (refer to Fig. 1), leveling-bulb (A) is raised until the mercury level is slightly higher than capillary tube (B). The stopcocks are then manipulated so as to displace all gas from capillary tubes (B) and (C), filling them completely with mercury or deaerated liquid from a previous test.

It may be necessary to lower leveling bulb (D) in order to permit flow through capillary tube (B). At this stage, the desorbing bulb will also be entirely free of any gas. With stopcock (E) closed, leveling bulb (A) is now lowered to an intermediate level—20 to 30 cm. below its former position.

A vessel containing the liquid to be analyzed is raised to the capillary (or inlet) tube (C). When stopcock (E) is opened in the position shown in Fig. 1, the liquid will flow into the desorbing bulb, where the pressure is somewhat less than atmospheric. After a suitable amount of test liquid (100 to 200 cc.) has been transferred, stopcock (E) is closed and the size of the sample is then determined by the weight or the volume removed from the vessel containing the liquid.

Next, the infra-red lamp is switched on, and cold water is sent through the water jacket. Then leveling bulb (A) is lowered about 70 cm. below the bottom of the desorbing bulb. The reduction in pressure that now takes

Laboratory Data On Accuracy, Rate Gas Desorption, and Apple Juice Analyses

TABLE I—ACCURACY of Modified Gasometric Apparatus

Test No.	Aeration of Samples Temp. (deg. F.)	Pressure (mm.)	Wgt. of Sample (grams)	Dissolved Oxygen (cc.) Found	Theoretical	Deviation
1	39.38	745	213.9	1.94	1.91	+0.03
2	51.44	746	212.3	1.63	1.63	....
3	68.18	746	211.3	1.29	1.31	−0.02
4	85.82	744	215.9	1.10	1.11	−0.01
5	99.50	746	204.7	0.93	0.94	−0.01
6	121.28	746	209.6	0.81	0.79	+0.02
					Av. dev	+0.01

TABLE II—RATE OF GAS Desorption Is Dependent Upon Sample Size and Viscosity of Liquids

Test Liquid	Vol. of Sample (cc.)	Cycles Required for Complete Gas Desorption
Water	100	5
Water	150	7
Water	225	7
Water	275	8
Water	350	9
Salad Oil	60	8
Salad Oil	80	10
Salad Oil	100	15
Salad Oil	200	20

TABLE III—ANALYSIS of N_2-Treated Apple Juice Mixed With Varying Amounts of Air-Saturated Water Show Complete N_2 and Low O_2 Recoveries

Composition of Test Samples Juice (Parts)	Water (Parts)	Found by Analysis N_2 (Percent)	O_2 (Percent)	Calculated N_2 (Percent)	O_2 (Percent)
A. Juice as received					
4	0	0.27	0.01	....	....
2	2	0.68	0.16	0.66	0.28
1	3	0.86	0.28	0.85	0.41
B. Juice saturated with high purity N_2 at 82.4 deg. F., 750 mm.					
4	0	1.06	0.00	....	....
3	1	1.10	0.09	1.10	0.14
2	2	1.04	0.12	1.06	0.28
1	3	1.08	0.31	1.08	0.42

TABLE IV—ANALYSIS of Aerated Apple Juice Indicates Absorption of O_2 by Chemical Combination With Juice

Aeration Time (Minutes)	N_2 (Percent)	O_2 (Percent)	CO_2 (Percent)	Ratio O_2: N_2 Juice	Solubility Dist. H_2O
A. Aeration temp. 33.8 deg. F.					
5	0.58	0.10	3.35	...	...
15	0.90	0.21	2.06	...	...
31	1.16	0.31	1.00	...	...
65	1.32	0.44	0.29	...	...
120	1.30	0.40	0.08	0.31	0.55
B. Aeration temp. 77 deg. F.					
5	0.50	0.04		...	...
15	0.74	0.15	...	...	...
30	0.84	0.21	...	...	...
60	0.86	0.21	...	...	...
150	0.86	0.20	...	0.23	0.53
C. Aeration temp. 107.6 deg. F.					
5	0.56	0.04	1.76	...	...
10	0.62	0.08	0.89	...	...
30	0.69	0.10	0.11	...	...
55	0.67	0.06	0.04	...	...
120	0.69	0.08	0.05	0.12	0.53

place causes the liquid level to drop in the desorbing bulb, leaving an evacuated space above the liquid. This space is filled by water vapor and more volatile materials evaporated from the solution.

If the depth of the liquid is great and agitation is poor, equilibrium is slowly attained between the several volatile constituents, the vapor normally being too high in water and too low in the permanent gases. Maximum stripping is hastened by maintaining a temperature gradient between liquid and vapor (by means of the lamp and cold water jacket) to produce continuous boiling action.

When gas evolution has ceased, leveling bulb (A) is raised to its top position, causing the liquid level in the desorbing bulb to rise and compress the liberated gases into a small bubble.

Meanwhile, leveling bulb (D) is raised above capillary tube (F). The gas buret and capillary tube (F) are voided of gas by controlling stopcock (G). The mercury level in leveling bulb (D) is then lowered until the gas bubble in the desorbing bulb can be transferred to the gas buret by manipulating the two stopcocks.

With stopcock (E) closed, leveling bulb (A) is again lowered, and a second, smaller bubble of gas is obtained. This bubble of gas is also transferred to the gas buret. Cycling is continued in this way until there are no additional gas bubbles. From 3 to 5 cycles are usually required.

When all removable gas has been accumulated in the gas buret, stopcock (G) is closed and the mercury level in leveling bulb (D) is adjusted until the pressure is exactly atmospheric. The volume of gas is then recorded.

A vessel containing 25 percent KOH solution is then brought up to the capillary (or inlet) tube (F), mercury level in leveling bulb (D) is lowered, and stopcock (G) is opened to permit a small amount of KOH (0.5 cc.) to run down the wall of the buret.

The KOH solution absorbs all CO_2 from the gas sample. And after a suitable drainage period, the pressure is again adjusted, and the new volume of gas is recorded. The decrease in the volume of gas first recorded represents CO_2 that had been dissolved in the liquid sample.

In adjusting the pressure at this stage, correction is made for the hydrostatic pressure resulting from the KOH solution. The density of 25 percent KOH is about 1.2 and the density of mercury is about 13.6. Therefore, it may be assumed that the pressures will approximately equalize if the height of the mercury level in leveling bulb (D) above the mercury level in the gas buret is one-tenth as great as the height of KOH solution above the mercury level in the gas buret.

After the CO_2 has been absorbed by the KOH solution and the remaining amount of gas is recorded, oxygen is determined by a similar sequence of operations. Only exception is that the reagent is freshly prepared alkaline pyrogallol, consisting of two volumes of 33 percent pyrogallol and one volume of 50 percent KOH. The volume decrease in this case represents the total amount of oxygen originally dissolved in the sample. The residual gas is the nitrogen and other gases not absorbed by the reagents used.

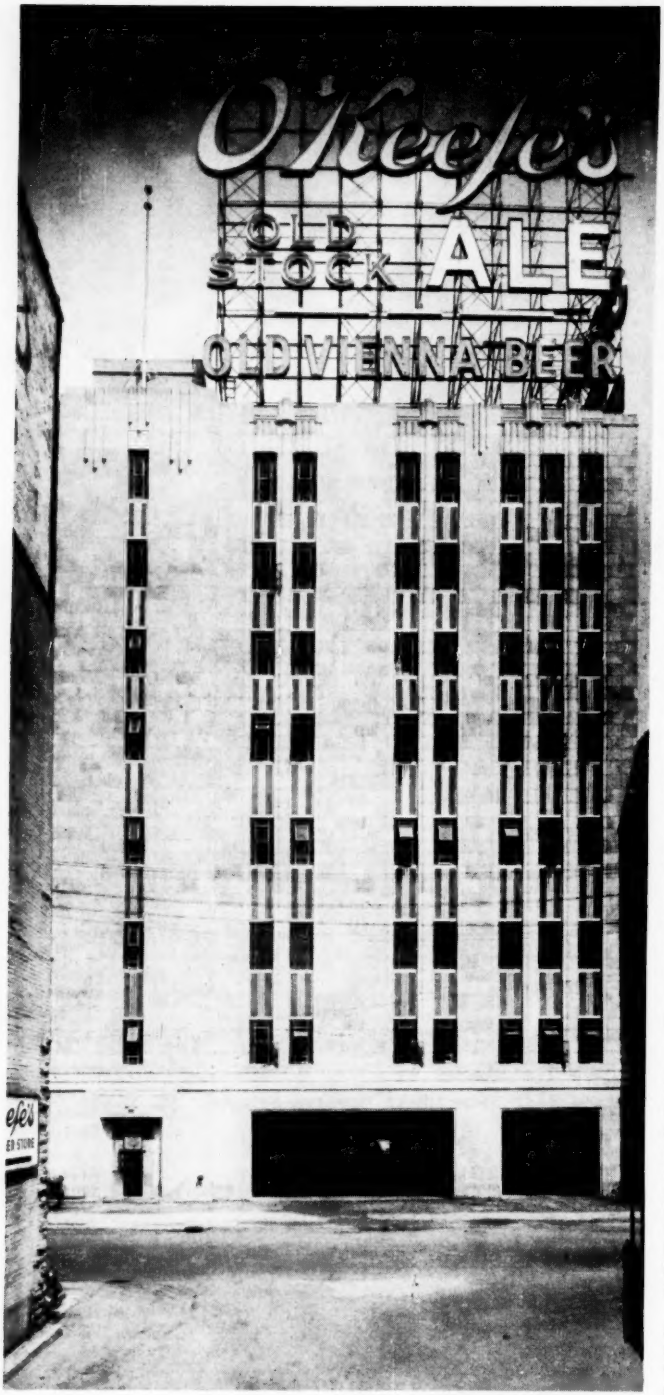
The gas volumes may be converted to STP (standard temperature and pressure) by suitable temperature and barometric corrections, divided by the volume of the sample, and multiplied by 100 to obtain the results as cc. of gas (STP) per 100 cc. of liquid.

About Portable Apparatus

As already stated, one requirement that influenced the selection of the gasometric method was that this analytical procedure be suitable for use in the field. Therefore, it was necessary that the equipment be portable and require only normal service facilities for operation.

Accordingly, a gasometric unit was

(*Turn to page* 201)



Feature of this multi-story bottling plant is . . .

Bottler Solves Vertical-Plant Problems

Canadian brewery's eight-story building in congested area has inside truck-loading facilities and maze of conveyors to move empty and filled bottles

T. G. FERGUSON
Vice-President, Engineering,
Canadian Breweries, Ltd.,
Toronto, Canada

Faced with an increasing demand for its product, and little space on which to expand, O'Keefe's Brewing Co., Ltd., completed, late in 1948, a multi-floor bottling plant, across the street from its brewery in the crowded downtown area of Toronto.

Beer is piped through tunnels under the street from the brewery to storage tanks on the 3rd floor of the new bottling plant (see Fig 2). From here it is fed into three bottling machines, located on the 4th floor, which handle 630 pint bottles per minute. This output is over three times that of the old bottling set-up, which was located in the brewery. The new facility has been in continuous use 16 hours daily during the winter and is expected to operate 20 hours daily in the summer.

Resembles Office Structure

The bottling plant has the outward appearance of an office building. Finished in Indiana limestone with aluminum trim, it is located in an area of office structures and retail stores, where the brewery has been situated for the past 110 years. The plant has eight stories above the street level, together with a basement. The two upper floors are for the head-office of the organization, Canadian Breweries, Ltd. Housed here are all administrative departments.

With the bottling plant located in such a busy section of the city, it was necessary to provide enough space within the building for truck unloading and loading operations. The entire 1st floor is therefore, devoted to these operations, (Fig. 3). Trucks can

enter from the lane back of the building or from Victoria Street.

At the end of the building, two electrically operated panel doors, each 29 ft. wide, and two similar doors 14 ft. wide, lift upward in five folding sections to allow trucks to enter the loading floor. The doors can be stopped at any height, so that they need not be opened fully to allow the loading employees to move back and forth from the street into the building. In cold or wet weather, the doors can be kept continually closed, opened only when entrance of men or trucks requires. Between the two wide doors is the entrance (through conventional glass doors) to the plant lobby and elevator.

Truck Loading

Space on the street floor allows for loading or unloading of 12 or 16 trucks at one time, depending on their length. For this purpose, six doubled-decked conveyor lines were installed. The lower conveyor line, for empty bottles in cartons, leads to the sorting room in the basement. The upper conveyor is for full bottles coming down from the storage and shipping room on the 2nd floor.

By use of extensible conveyors, projecting into the trucks, complete unloading and loading operation of most highway carriers can be accomplished in 25 to 30 min. Trucks hold from 500 to 600 cases (2 doz. bottles a case).

In laying out this vertical bottling plant, the aim was to obtain the greatest advantage from the available site and accommodations. Some of the problems encountered are evidenced by the fact that the building measures 145 ft. street frontage and has a depth of 100 ft. A major problem was the designing of conveying equipment to allow continuous operation, both upward and downward, with greatest efficiency and ease of maintenance. There is a maze of conveyor installations on each floor. That it all operates smoothly, however, is best shown by the fact that about 1,500 cases come off the filling floor every hour.

Returned Bottles and Cartons

Tracing the process, from the time empty bottles enter the building on a truck, demonstrates the compact operation and use of space on all floors. Empty bottles are received at the plant in several sizes of cartons. They first go to the sorting room in the basement by conveyor. Here, the bottles are sorted as to white and green, the former for lager, the latter for ale. Then they go to empty bottle storage—either in the basement, on the 5th floor (start of the washing line), or on the 6th floor.

On the 5th floor, they are unpacked from the carton by one of a three-man

. . . its intricate, efficient system of conveyors

Bottling Room Utilizes All Available Space on 4th Floor

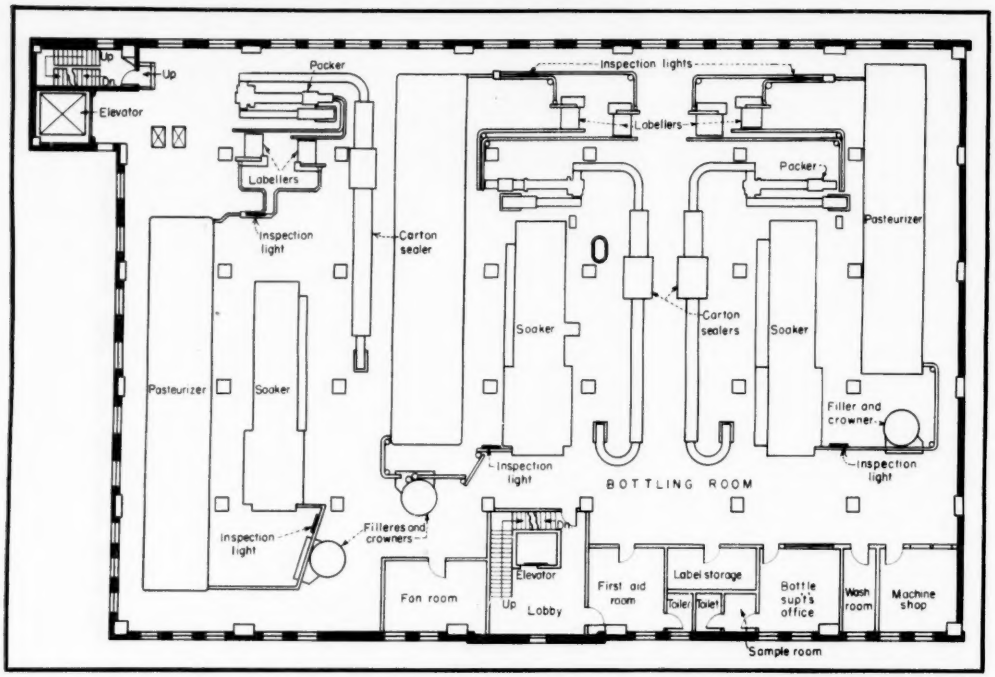
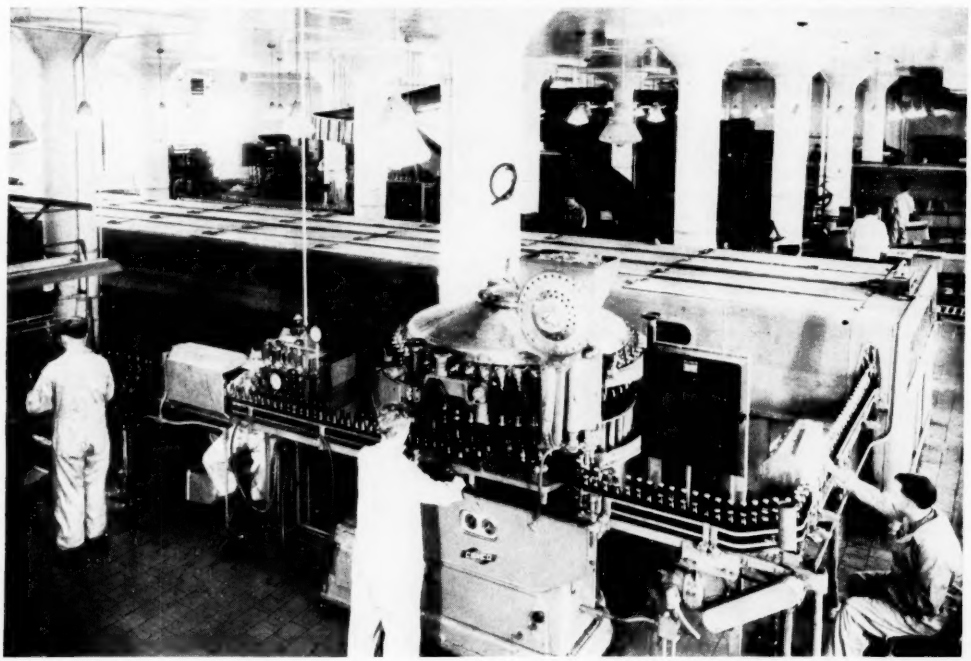


FIG. 1. **LACK OF SPACE** in the bottling room necessitated deviations from straight-line bottling operation.



COMPACTNESS of operation characterizes bottling room. Clean bottles from washer (left) are filled and crowned (foreground), then enter pasteurizer (right). Cooled bottles leave pasteurizer, then turn into labeler and packer.

crew at the loader which feeds the soaker bottle washing machine, just below on the 4th floor (see Fig. 2). Empty cartons are sent down to the basement for baling and shipping to the pulp mill. Because of space limitations in the beer bottling layout on the 4th floor, bottles do not move in a straight line to find their way into a carton of full bottles. Layout of washing machine, filler and crowner, pasteurizer, labelers and packing machine is on the square-block principle (Fig. 1), with the conveyor line making a complete circuit of itself. This layout permitted three bottling units to be installed in the limited 145 x 100-ft. 4th floor area.

The empty bottles, having been taken from the carton, are placed on the moving carrier which leads down to the soaker. After thorough washing and sterilizing, the bottles pass in front of an inspection light, where inspectors with green eye shades sit for ½-hr. shifts. The bottles then continue at a speed of 210 a minute into a 50-spout filling and crowning machine that is operated on the counter-pressure principle to minimize air content and agitation.

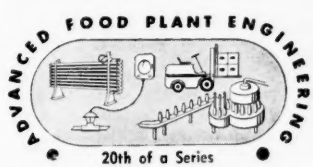
Third Floor Cellar

Beer enters the filling machine from the bottling cellar on the 3d floor, where there are eight 7,500-gal. horizontal, glass-lined storage tanks. Six of these tanks are used each day, and are given a thorough cleaning and sterilizing after each is emptied. Then they are refilled with beer from the brewery across the street.

The bottling cellar is divided into two sections, with four tanks in each section. Tiled corridors give access to the controls at the end of each of the 7,5000-gal. tanks, the remainder of the tank not being visible. They are accessible, however, through a number of passageways. This method of installation aids in keeping down cleaning bills, including brushing, hosing and painting.

After leaving the filling and crowning machine, the filled bottles are conveyed to the spray-type pasteurizer, where they are heated, held, pre-cooled, and cooled under automatic control. They then move along a conveyor to an inspection light, where they are again examined by inspectors.

Bottles leaving the pasteurizer are



Location Dictated Type of Building and Inside Loading

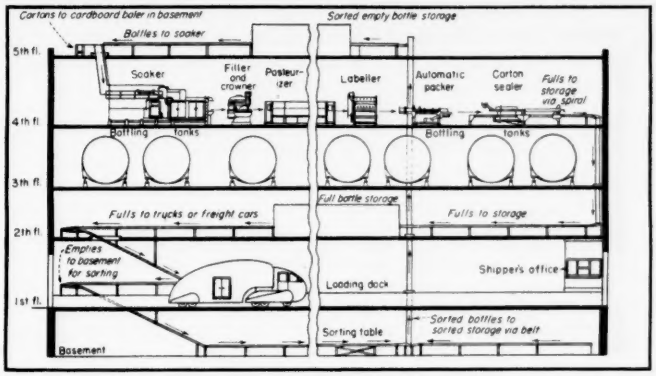


FIG. 2. **BY SITUATING** bottling room on the 4th floor, ample storage space for empty and filled bottles was provided above ground level loading area.

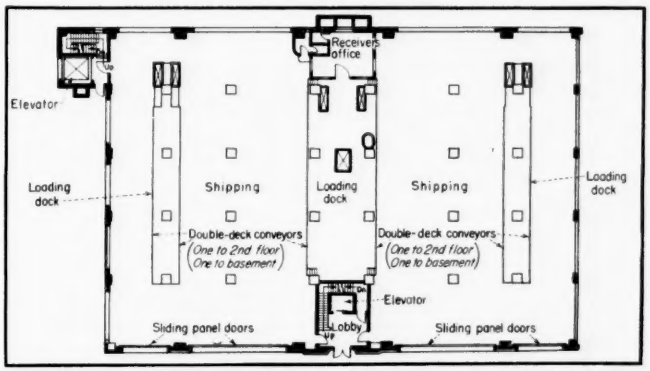
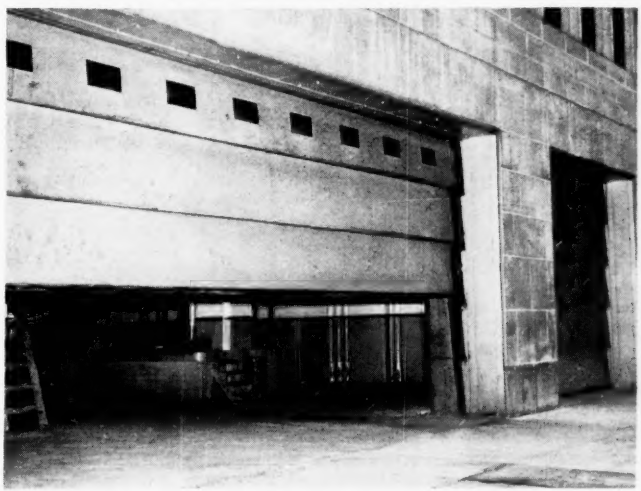


FIG. 3. **ARRANGEMENT** of loading docks on 1st floor permits simultaneous inside loading of 12 to 16 trucks, depending on their size.



ELECTRICALLY operated doors simplify entrance, exit of trucks.

separated into two lines, alternate bottles going into each line. This permits better inspection, due to lower speed in front of each of the two inspectors. Each line then feeds into a separate labeling machine, where six bottles are labeled at one time. The multiple labeling is at relatively slow speed, which minimizes breakage. The two conveyor lines then converge and the bottles move to the automatic bottle packer.

Cartons are assembled on the 3rd floor and fed up to the packer by a pusher-bar conveyor. The operator places the carton in the packer, trips the case loader, and 24 bottles drop into the carton. The full carton now moves along a conveyor to the carton sealer, and then, by spiral conveyor, drops two floors to the shipping room on the 2nd floor. From here it may immediately go into a truck, or be stock piled.

Additional Facilities

Storage facilities are provided on most floors. Thus, the 3rd floor, in addition to having the bottling cellar, also has room for flat carton storage, an employees' lunch room, lockers, showers, and other employee facilities. The 4th floor, in addition to the complete bottling operation, has a first aid room, materials storage, and the office of the bottling superintendent. On the 5th floor, in addition to sorted empty bottle storage, space is provided for storing crowns, labels, and alkali for cleaning. The 2nd floor has a shipping office, and on the ground floor there is the office of an assistant shipper and receiver.

The main disadvantages of multi-floor operation are splitting of supervision between the different floors, and the necessity for complicated conveyor systems.

But in the case of this plant, these disadvantages are more than offset by the proximity to the brewery, which allows easy piping of the beer to the bottling plant. This eliminates trucking and re-carbonation of the beer. Incidentally, the building of the new bottling plant has enabled the brewery to increase its capacity from a pre-war 140,000 bbl. to 550,000 bbl. annually.

Delivered Over Wide Area

The O'Keefe branch of Canadian Breweries, Ltd., has five breweries in Ontario. Deliveries to the customers, throughout Ontario and Quebec province, are handled by a separate company, Canadian Breweries Transport, Ltd., which maintains a fleet of 150 highway trailers and city stake delivery trucks. These are, for the most part, painted in O'Keefe's colors—light blue with gold lettering—and include bodies of various types.

Latest models are streamlined highway trailers with double doors for loading and unloading, the double doors strengthening the body structure. With this fleet, the company is able to handle about 60 percent of its hauling operations, depending on contract carriers for the balance of peak-load haulage.

While all trucks are not maintained at Toronto, the company maintains a service garage on Toronto's water front, close to another company of the Canadian Breweries organization. Trucks are serviced on a mileage and time basis.

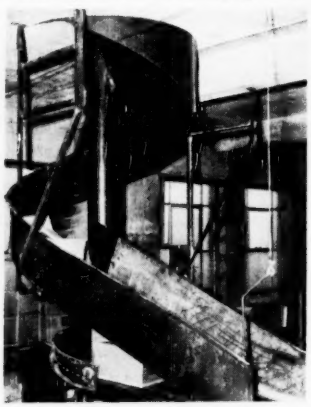
No refrigerated trucks are used by O'Keefe's. However, the trucks are all lined with fiberboard, which tends to keep beer in transit at an even temperature on the short hauls made by the trucks. Hauls of 200 miles or more are usually made by refrigerated railroad cars, trucks taking beer from the bottling plant to railroad sidings.

For local home delivery in Toronto, O'Keefe's trucks are used as well as those of contract truckers, peaks of 5,000 to 6,000 home deliveries being made each Saturday.

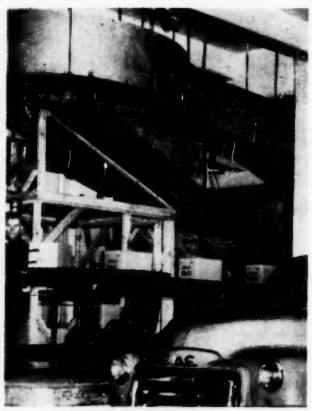
The new bottling plant is part of an expansion program of Canadian Breweries, Ltd., which includes not only new plants in other parts of Ontario, such as the recently completed plants at Ottawa and at Waterloo, but also expansion and modernization of the adjacent O'Keefe's brewery in downtown Toronto.

O'Keefe's beer is distributed in the U. S. through O'Keefe's, Inc. Another Canadian Breweries product, Carling Beer, is distributed in the U. S. by Brewing Corp. of America.

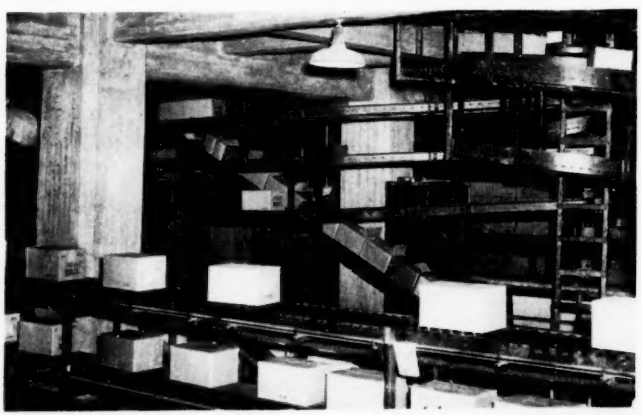
Conveyors Move Empty and Filled Bottles to All Floors



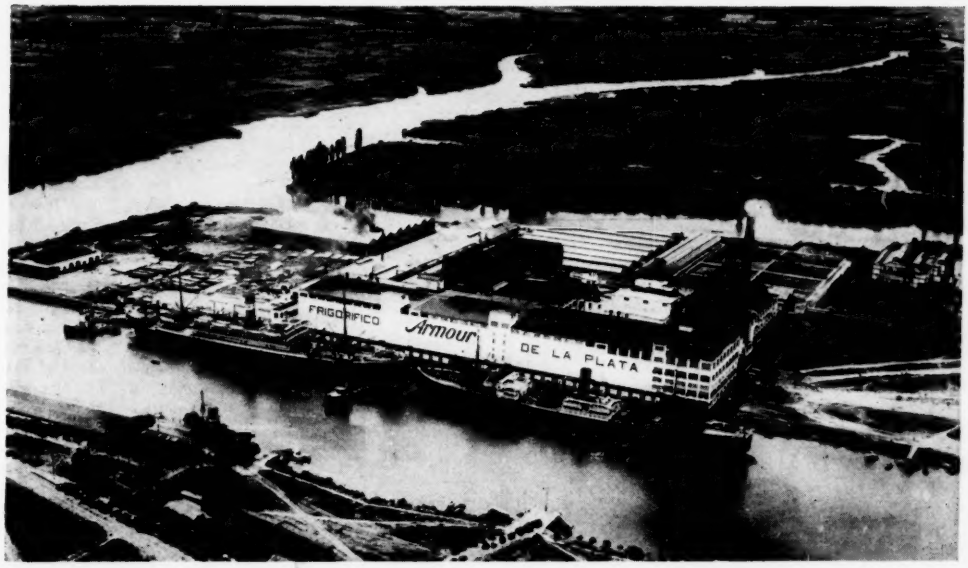
SPIRAL CHUTES bring empties from 6th floor to 5th floor soaker feed.



ROUGH-SURFACE BELT and roller conveyors move bottles to 1st floor.



SECOND FLOOR has maze of conveyors. Inclined ones elevate empty cartons (left) to 3rd floor storage, and take cartons of empty bottles (center) to 5th and 6th floors. Spiral conveyor (right) lowers filled cases from bottling room. These may be shunted to any of the horizontal conveyors.



THE "BIG 4" U. S. meat packers are represented by plants such as this Armour "frigorifico" near Buenos Aires.

Is Argentina Looking for New Meat Outlets?

Quantities of fresh meat have already gone to U. S. Army, and canned meats are now moving into domestic markets in this country

JOHN WILHELM
McGraw-Hill World News
Correspondent at Buenos Aires

It is now generally thought that the world meat trade picture will undergo some drastic alterations in the coming months. Argentina, whose exports of over 500,000 tons of meat and meat products annually makes her the world's largest meat exporter, will be the key figure in any changes.

Most nations take care of their own meat situation in that their domestic production equals domestic consumption. The most important exception to this is England, which imports some 3,500,000,000 lb. of meat annually—getting approximately one-half from Argentina. The balance comes from Australia, New Zealand and Canada, along with small quantities from Uruguay, Brazil and other exporters. All in all, England has traditionally imported about 90 percent of all meat sold on the international market.

But now Argentina seems determined to get a better price for her meat by drumming up some new customers. The country took a step in this direction last year when she specified, in her overall trade agreement with England, that 22 percent of her export meat would be available for sale to other countries. Of this, she contracted to sell Belgium 32,000 tons and Holland 40,000 tons with smaller amounts going to Bizonia, Venezuela, Switzerland, Egypt and Palestine.

Another change in the meat picture involved the United States. From a non-meat exporting country before the war, the U. S. shipped so much meat abroad during the war (largely to military areas) that it became second only to Argentina.

Argentina, on the other hand, has recently started to sell fresh meat directly to the U. S. Army quartermaster. The U. S. Army, calling for open bids, got its lowest price from representatives of Argentine beef. Incidentally, it was probably the best price at which Argentine beef has ever been sold. Boned out beef to the amount of 5,200,000 lb. was sold to the U. S. Army by Argentine producers for 28.195c. per pound for 2,000,000 lb., and 30.41c. per pound for 3,200,000 lb. This compares very favorably with the roughly 18c. per pound that England pays to Argentina for the 400,000 tons it contracted for last year. Of this total, Argentina will only fulfill some 340,000 tons within the specified time, partly due to her shipments to other countries.

Earlier, the U. S. Army Quartermaster had made several other purchases of dressed and boned beef at 21c. per pound, as well as having purchased large quantities of turkeys from the Peron republic.

Since these purchases go direct from Buenos Aires packing houses to occupation troops overseas, the purchases in no way violate the U. S. Department of Agriculture's ban on importation of fresh Argentine meats into the continental U. S. This restriction, as is well known, is to prevent the spread of the cattle disease, aftosa or hoof and mouth disease as it is more generally known to North Americans. While this disease takes a very mild form in Argentina, it becomes much more virulent in the northern hemisphere, according to cattle experts.

With a tight meat situation in the States, and with prices high, the U. S.

The Corned Beef Figure—And What It Would Take

At the price corned beef is now sold wholesale to the U. S. distributors—roughly $800 per ton—it would take some 150,000 tons of corned beef to produce the calculated yield of $100,000,000, according to a leading economist in Buenos Aires.

A net ton of canned meat is equivalent to 2.8 tons of dressed weight, which in turn corresponds to 5 tons of live weight. This means that some 2,000,000 to 2,500,000 head of cattle would have to be slaughtered merely to meet this corned beef figure.

As the total slaughter of cattle for export in Argentina last year was only 2,450,000 head, it can be seen that such large scale sale of processed meat in the U. S. would take virtually the entire Argentine production, leaving very little for England—the traditional market.

Army felt justified in saving the taxpayers money by making these purchases in Argentina. Even so, western U. S. cattle interests have protested the purchase.

In addition to selling fresh meat to the U. S. Army for dollar currency (Argentina is extremely hard-pressed for dollars at present and will likely continue to be short for sometime), Argentina also is mulling over plans for a major invasion of the canned meat field in the States.

Argentina has already stepped up her corned beef sales to the States—a trade of many years standing, but never of major proportions. It is expected, however, that this year she will sell some $25,000,000 worth of corned beef in the U. S. Over $12,000,000 worth was actually sold in the past six months.

U. S. Ambassador James Bruce, together with U. S. meat distributors, has calculated that Argentina can sell in the neighborhood of $100,000,000 worth of corned beef and other tinned meat per year in the States. As the entire question is problematical, other experts challenge these figures as somewhat excessive.

Ambassador Bruce's interest is in reviving Argentine-American trade, now dying on the vine for lack of dollar sales, which has shut down sale of U. S. cars, industrial equipment and manufactured goods. He says he is convinced that if Argentina removes its 20 percent export tax on corned beef, the price of corned beef would fall so low that sales would boom in the States.

Actually, the problem is to keep Argentine corned beef well below the cost of processed tinned meats (Spam, etc.) manufactured in the States. Thus if a can of such meat sells for 41c., Argentine corned beef must be sold for 35 or 36c. to attract a big market.

Under present conditions, Argentine corned beef cannot meet these competitive price levels. Removal of the export tax, however, (a rarity in world trade anyway), would make the difference, and it is now fairly certain that Argentina will remove the tax in the next few months. It will still have to meet the U. S. duty, but this is no great hindrance to increased sales.

Other Canned Meats

Another possibility, though more remote, is that the Argentine *frigorificos* (packing plants) may try to place on the world market some of the many other tinned meat products (tongue, beef stew, roast beef, vienna sausages, etc.), which they already produce for Argentine markets.

There is little reason why they could not also go into the processed canned meat field. Of the 19 packing houses in Argentina, the largest and most modern include the two Swift plants, the two Armour plants, and the Wilson plant.

One of the main difficulties to increasing the tinned meat sales in the States is that the entire supply of tinplate must be imported. England supplies tin-plate to Argentina only with the provision that it must be used for meat going to England. Tin-plate is available from the U. S., but it must be paid for in dollars, and Argentina has lagged in picking up her allotment under present quotas. This could be arranged as long as the sales will net dollars.

The political aspects of the situation have already been made clear. Last year, Miguel Miranda (then Argentina's economic czar) drove a hard bargain with the British. This year, Argentina has not sent anyone to England to negotiate. And England has reduced her domestic meat ration.

Now it is clear that some arrangement will soon be made with England to continue meat sales. But it will probably be for much less meat at a much higher price.

This brings us to the subject of future meat trade between Argentina and England. As was mentioned, England has traditionally imported nearly 100 percent of Argentina's exports. Englishmen came originally to Argentina and improved the cattle until the fine beef herds of today were developed. The English also built the railroads that bring the cattle to the *frigorificos* (always built at dockside in Argentina), and the English have until recently operated the fast refrigerated ships carrying the chilled beef to England.

Further, England and Argentina have a natural trading relationship. Argentina needs industrial and manufactured goods that come from England, while England certainly has need of the Argentine beef. (Talk of England's developing an all-empire meat supply is going on, but this could not affect developments short of five or six years.)

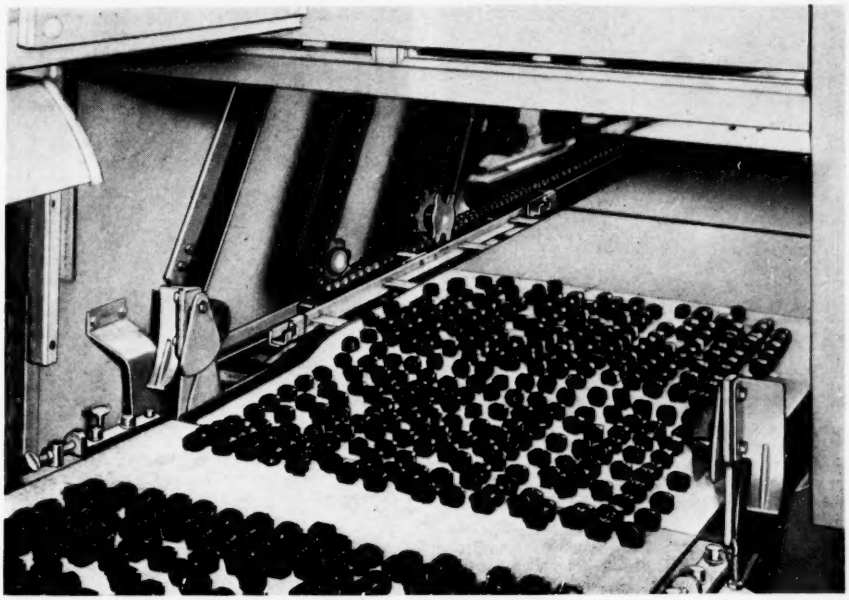
But Argentina has now come to prefer many North-American goods over the English counterparts. For example, 90 percent of the automobiles in Argentina are of U. S. manufacture. The same goes for many other products. This is why Argentina would like to develop the U. S. market directly, although in the past England sold to the States and turned dollars over to Argentina, making a three-way trade setup. It is not likely that England can resume this practice in the near future.

England, however, will not likely be able to replace these lost meat imports. It is a peculiarity that a process of "chilled beef" has been developed so that Argentine beef can be killed and placed at once in cold chambers only a degree or so below freezing, then loaded within a few days into refrigerated ships, where the same temperature is maintained. These ships, especially built for the trade, travel at high speeds to England, where meat is unloaded in the port of London and placed in the markets the same day.

Fresh meat is in this way made available in England without harming the meat by having to "hard-freeze" it. Actually, the "chilled beef" never is frozen.

But to bring the meat from Australia entails a voyage about six days longer than the meat will stand up under this process. Thus, meat from Australia is frozen solid. Losing Argentine beef would mean an inferior grade of beef for England.

Another factor is that Argentina has always graded its cattle in three classes. The best class was exported fresh. The second best was sold frozen or tinned. The third, or worst, was used at home. President Peron would like to reverse this process, though he hardly can and keep his meat trade.



CHOCOLATES emerge from multi-tier cooler. This advanced unit is for processes requiring "waiting."

CANDY PROGRESS

Advanced methods and equipment increase productivity, cut costs, improve quality. These may be adopted by all confectioners to maintain profits when prices drop. Other food processors, too, can apply many of them to good advantage

FRANK BUESE*

Senior Staff Member,
A. T. Kearney & Co., Chicago

The downward trend in candy consumption (see charts) which sooner or later will be reflected in its price, portends a test of the stability of all candy manufacturers.

What have candy manufacturers done factory-wise to prepare for this test? How will wartime weaknesses be strengthened? What direction of action will confectionery manufacturers take to secure additional protection against possible adverse business conditions?

The latest advances in the following elements of production are worthy of consideration: (1) Equipment and methods of manufacturing, (2) materials, (3) personnel policies and practices, and (4) industrial or production engineering.

The candy machinery industry has grown up in the last decade. In earlier days, machinery was designed and built to a price—usually a relatively low price because many small confectioners would not purchase a high-priced machine. The candy-machine builders were not in the position of the machine-tool builders from whom the wealthy automotive industry demanded trouble-free performance, with price a secondary consideration.

The large, profitable confectionery manufacturers, however, began to demand rugged, durable, high-production equipment, capable of producing better quality candy. And conferences between candy manufacturers and equipment builders have resulted in the redesigning of many machines to improve operation, sanitation and maintenance.

Enrobers Have Been Improved

Chocolate enrobers (coating machines) now are built with larger blowers to remove surplus coating and with a panel for all switches and valves to make operations easy. The mixing-pot agitator is driven separately so that its speed of rotation is independent of the speed of the conveyor. Since the speed of the agitator formerly varied with the speed of the conveyor, the chocolate was beaten at the higher speeds into an unnatural color and consistency—chiefly through the inclusion of air. Agitator blades are designed to stop air inclusion.

* Formerly industrial engineer, E. J. Brach & Sons, Chicago, and production manager, Queen Anne Candy Co., Hammond, Ind.

Starch-Casting Operations →

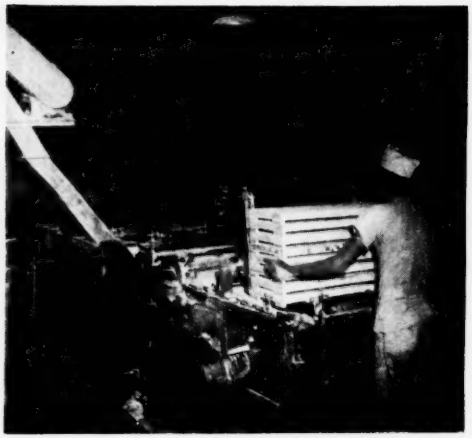


Photo Courtesy Nutrine Candy Co.

MOGULS for starch-cast candies receive and empty trays of solidified centers, separate the candies from starch, refill trays with conditioned starch, reimprint starch, and deposit molten candy into imprints. Rate: 12 boards a min.

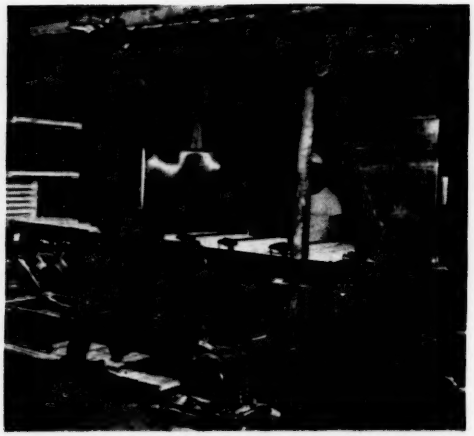


Photo Courtesy Nutrine Candy Co.

DEPOSITING of molten candy, with or without dropping of cherries or pineapple cubes, into imprints in boarded starch is done by depositors; mogul operations are synchronized for steady flow of starch boards to stacker.

Sanitation has been greatly improved by: (1) Accessibility of all working parts, (2) design for quick disassembly of pumps and tempering column scrapers, and (3) greater use of stainless steel and aluminum.

In one design, the wire-belt assembly can be rolled out of the body of the coater to permit accessibility to the belt and to the chocolate pot. Appearance has been streamlined. Sheet-metal housings are provided for all working parts. Ultraviolet lights are installed for destruction of bacteria.

Motors are more powerful—usually of the geared-in-head type and connected with variable-speed drives. Anti-friction bearings are in general use. The manufacturers have used standard gears and other parts, thus simplifying repairs. Automatic temperature controls are not new, but they are now standard equipment on coating machines. Some are designed to operate by electric current rather than compressed air so as to eliminate air compressors.

Chocolate coaters have been built in which two kinds of chocolate can be run simultaneously. Thus, candy centers in a variety of flavors may be fed to the coating line in two groups—one to be covered with a milk chocolate and the other with a dark-sweet or other type of a non-milk chocolate. This arrangement eliminates the inter-

Chocolate Melting, Tempering, Coating and Cooling →

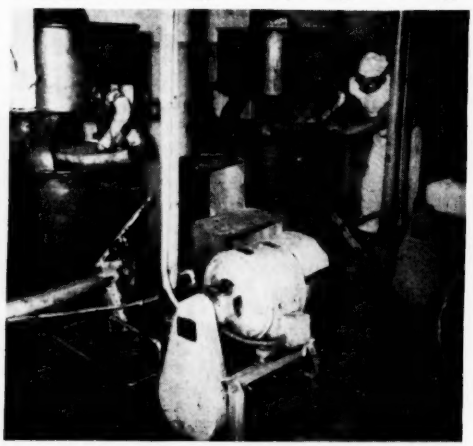


Photo Courtesy Nutrine Candy Co.

MELTING AND TEMPERING chocolate for spray coating. Upper kettle melts chocolate; lower kettle tempers it to desired temperature. Chocolate is pumped through thermostatically controlled, water-jacketed pipes to point of use.

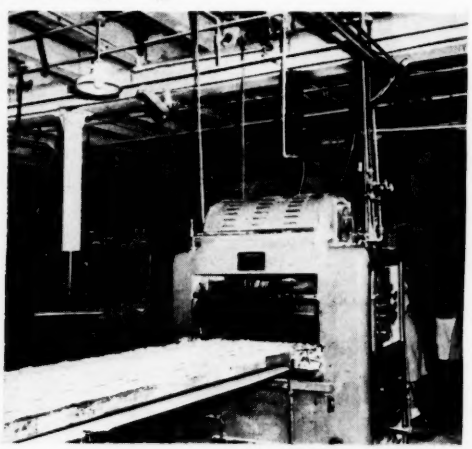


Photo Courtesy Queen Anne Candy Co.

CHOCOLATE COATING MACHINES, with widths ranging from 24 to 42 in., are equipped with automatic temperature controls, fans, and mechanical shakers to give the desired finish to the coating on the candy centers.

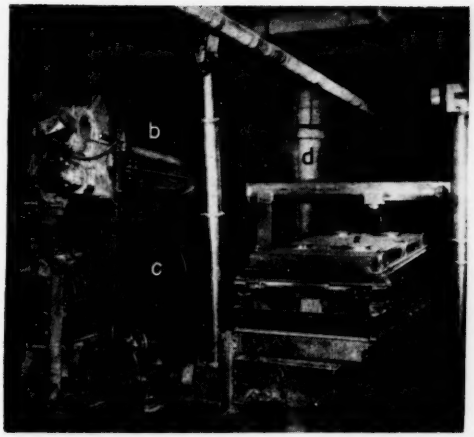


Photo Courtesy Nutrine Candy Co.

CASTING STARCH is re-used after it has been cleaned. Sifter (a) removes bits of candy and lumps of starch. Drier (b) heats starch and takes away excess moisture. Warm starch is then cooled (c) and collected in cyclone (d).

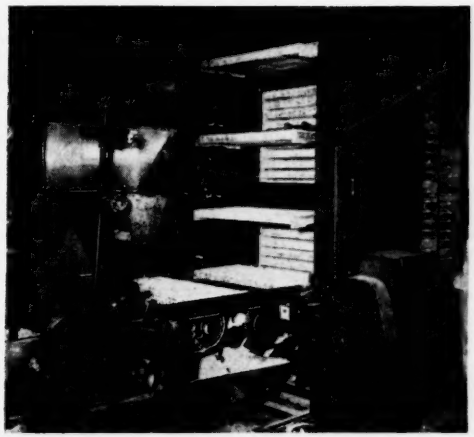


Photo Courtesy Queen Anne Candy Co.

AUTOMATIC TRAY STACKER (right), located at discharge end of the mogul, does away with all manual labor, except for taking dollies holding 32 boards from stacker to drying room. Here trays are held until candies dry.

mediate operation—packing in stock boxes when the candy is to be packed from the line into consumer packages. The result is lower labor costs, less damage to finish, and reduced inventory of material in process. Usually, the completeness of assortment in the fancy package is less than that obtained by packing assortments from stock boxes.

As an accessory to chocolate coating, various devices have long been used for decorating the candies. Hand work variously known as "hand-stringing", "stroking", "roughing" and "tube decorating" is still in use, but expensive at today's wages.

The most common type of machine decorators consists of light moving belts of metal or fabric, which come in contact with the candy as it leaves the enrober. The contact produces a design on the top of the piece and roughs up the natural smoothness of the surface. The better machines are equipped with thermostatic temperature controls which prevent graying of the chocolate by temperatures that are too high, or "skinning" of coating from surface of the centers by temperatures that are too low.

Although the manufacture of chocolate falls into a different classification than candy making, some of the chocolate-making equipment, such as melters and tempering units, also is used

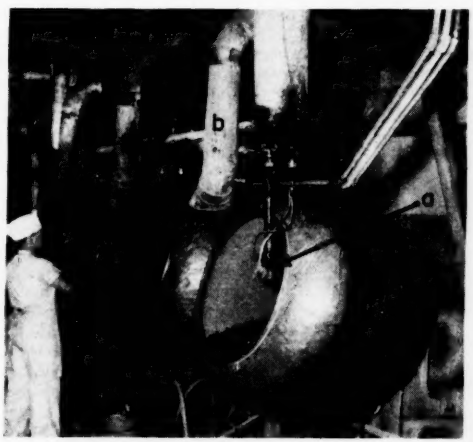


Photo Courtesy Nutrine Candy Co.

REVOLVING PAN METHOD of applying chocolate coatings to candies. Tempered coating is fed to pans through the spray mechanism (a), while a current of cooled air, fed through ducts (b), hardens the coating as the pans rotate.

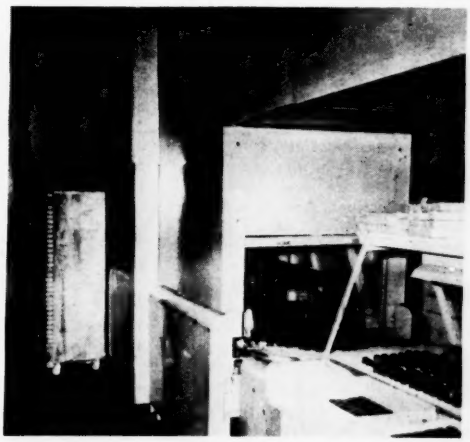
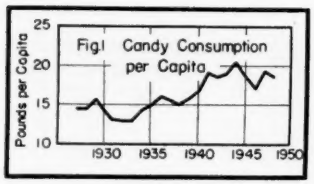
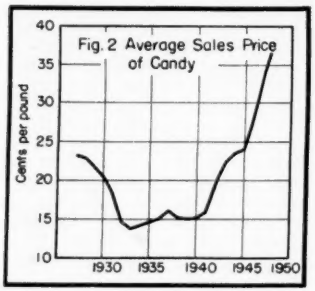
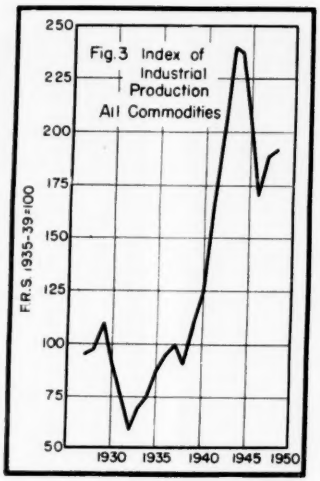


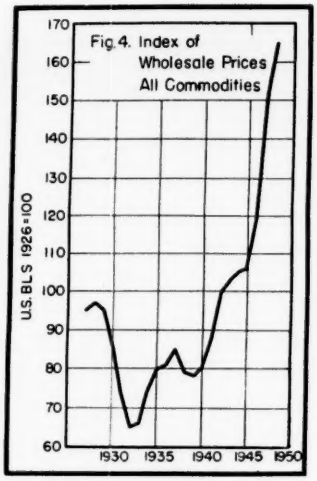
Photo Courtesy Archibald Candy Corp.

COOLING chocolate-coated candies in a multi-tier cooler, which reduces floor-space requirements. Total traveling distance in the cooler may be 700 ft. Coolers may also be equipped with automatic loaders and unloaders.









CHARTS GIVE QUICK PICTURE of candy consumption and sales prices. Fig. 1: Per capita consumption of candy ranged from low of 13 lb. in 1932 and 1933 to high of 20.5 lb. in 1944. Fig. 2: Manufacturers' sales price of candy rose from $0.139 per lb. in 1933 to $0.38 per lb. in 1948 (preliminary). Fig. 3: Industrial production activity. Note correlation with per capita candy consumption (Fig. 1). Fig. 4: Wholesale price index of all commodities between 1927 and 1948. Note correlation with the average sales price of confections (Fig. 2).

Industry Strives to Keep Consumption High

Industry statistics revealed in Figs. 1 and 3 (above) show candy consumption rises and falls with the prosperity of the country as measured by the indexes of industrial production. Those in the confectionery business fervently hope that per capita consumption will never again reach the low level of 13 lb., as it did in 1932 and 1933.

Aggressive advertising projects were directed to check the decline from 20.5 lb. in 1944 to 17.3 in 1946—with the results that the per capita consumption in 1947 rose to 19.3 lb. However the preliminary figure for 1948 indicated a decline to 18.8 lb. which again reflects the effect of decreased overall industrial production.

The manufacturers' price curve for candy as shown in Fig. 2, follows the general trend of the wholesale price index for all commodities indicated in Fig. 4. Comparison of the candy consumption curve in Fig. 1 with the candy price curve in Fig. 2 shows that the decline in consumption was not accompanied by a decline in price up to the end of 1948. However, there was an indication of weakness in the market at the close of 1948.

Assumption can be made on the basis of this weakness that the price level trend is downward. If that assumption is later proved by statistics, the key question will be: To what point will the price level decline? Hopes are strong that the 14-cent level of the depression years will be averted.

Chocolate melters with capacities of 100 to 2,000 lb. are being built of stainless steel for improvement in appearance and sanitation. In all progressive plants, the old manual operation of "carrying chocolates" has been eliminated by pumping. In some cases, the chocolate is pumped at the melting temperature (above 100 deg. F.) to special continuous tempering machines, from which it flows into the enrober. In other installations, the chocolate is tempered in jacketed kettles—which also are used as chocolate melters—and then is pumped in a tempered state to the enrobers. Either installation requires jacketed piping. The temperature in the lines is maintained by thermostatically controlled water, circulated from an adjusting tank through the jacket of the kettle.

Chocolate is tempered by—

1. Circulating cold water through the jacket of a melting kettle—the oldest mechanical or batch method.

2. Passing the chocolate over a series of water-cooled rolls—probably abandoned, because this equipment has not reappeared since the war.

3. Forcing the chocolate through a metal tube, equipped with a rugged screw conveyor and a jacket through which thermostatically-controlled water is circulated.

4. Pumping the chocolate through a series of vertical water-jacketed tubes, fitted with power-driven scrapers to remove the chilled chocolate from the inside walls of the tubes as it is forced through by the action of the pump.

The last two continuous methods give most uniform finish and longest shelf-life to chocolate. In all methods, the chocolate is cooled between 86 and 88 deg. F., then slightly reheated to 89-90 deg. F. before delivery to the coater. Use of thermostatic controls and recording thermometers is essential to good practice.

The function of cooling tunnels is to harden confectionery products by removal of heat from hard candy and chocolate and caramel-coated pieces. This type of tunnel is not usable for drying where moisture, as well as heat, must be removed. The factors in heat removal are temperature difference between the air and the product, time of exposure to the air, volume of air, velocity of air, and volume of product.

Theoretically, the cooling operation should be engineered to the volume of production desired. But, since the temperature of the candy is determined by the process or operation preceding cooling, the operating temperature difference depends upon the air temperature employed. While very low temperatures are mechanically feasible, temperatures below 40 deg. F. are likely to result in discoloration of the chocolate coating because of moisture condensation from the warmer air. This consideration limits temperature differential between air and candy.

Velocity of air in the tunnel is limited by the ease with which the candy may be blown about on the tunnel conveyor by the force of the air stream. Maxi-

mum velocities of 1,500 ft. per min. are obtainable and usable. The volume of air is determined by the cross-sectional area of the tunnel and the velocity of the air. Best current designs provide ample cross section, so that the volume of air is great enough to prevent more than a 10 deg. F. rise in air temperature between air inlet and outlet.

Cooking Tunnels Lengthened

The remaining important cooling factor is time of contact. No substitute has been found for adequate cooling time. If it is too short, the chocolate coating will be soft and greasy. The length of time in the tunnel is calculated by dividing the length of the tunnel by the speed of the conveyor. Short tunnels require low speeds. Low speeds raise labor and overhead costs.

To keep candy competitive in cost with other commodities, tunnels have been steadily increased in length, so that conveyor speeds of 12 to 15 ft. per min. may be maintained. Horizontal, single-run tunnels are 100 ft. or more in length. Even this is none too long, and future plant layouts may allow for double that length.

Another solution for the problem of increasing cooling time is to use multiple-level conveyors. As much as 600 ft. of travel is thus obtainable. Although investment and maintenance costs are increased, the unit solves the problem of cooling time in existing buildings and does not require air temperatures as low as on single-run conveyors.

The counterflow principle of air and candy movement is best practice. In this system, the coldest air is introduced at the end of the tunnel from which the candy is discharged, is blown in a direction opposite to the travel of the candy, and absorbs heat from it. Consequently, the warmer air strikes the warmest candy at the entrance of the tunnel and improves the finish of the chocolate surface.

The widths of coating and cooling installations have progressed from the nominal 16 to 24 in. and then to 32 in., now considered standard. Units of 40-in. width are in use, with 48-in. widths under consideration. The chief objection to units wider than 32 in. is the inconvenience to the worker, who must reach the center of the conveyor to perform operations such as feeding, decorating or packing. Various mechanical contrivances have eliminated this objection for decorating and packing operations.

Equipment and operating conditions for making chocolate candies differ considerably from those for hard candy. Most hard candy is cooked under vacuum, and new cookers with capacities as high as 3,500 lb. per hr. are advertised by at least one manufacturer. A moisture content of less than 1 percent is required in all vacuum-cooked hard candy to prevent sticking in the package. The cooker must meet this specification to be a success.

Mixing machines have reduced the manual work required "on the slab." Further development to fully automatic mixing will probably be seen. No foreseeable mechanization will eliminate the manual set-up of striped products, cut-rock, and similar items. But application of motion study and provisions of specialized hand tools can improve such jobs.

Making Hard Candy

Cutting and forming machinery are being built more rugged, and for higher speed than prewar ones. This trend will be continued, as in most types of machinery. Sizing rolls are used increasingly to reduce the skill required of feeders, known as spinners, to cutting and forming machines.

Great advances have been made in hard-candy cooling operations. As in the case of chocolate cooling, when speeds of production have increased, cooling tunnels have been lengthened. Lower air temperatures often are undesirable because "satin" finish is checked or crazed by sudden application of cold air.

Conveyors designed for adequate cooling provide as much as 200 ft. of travel. On chain-type cutters, the first run must travel at cutter-chain speed of over 200 ft. per min. At the end of the first run, the string of candies is separated and distributed across a much wider conveyor, traveling 10 to 20 ft. per min. for long, slow cooling. Multi-level conveyors are entirely practical because hard candy can be dropped from one level to another, requiring no complex mechanism.

Hard candy has been taken out of the seasonal class by the wrapping of individual pieces in moisture-resistant materials. This trend certainly will continue. Wrapping machines with speeds up to 750 pieces per minute now are used to form and wrap the warm product. Machines which wrap formed and cooled candies operate at the rate of 250 pieces per minute.

Casting Candies in Molds

In contrast to hard candies, other types are shaped by depositing or pouring into molds and then allowing to cool and dry so as to hold a predetermined shape. In the case of fondants, creams and gums, this shaping is termed "casting."

Casting candy in starch molds, as metals are cast in sand, is an old method of forming. No satisfactory substitute method for high-volume production has been found. However, numerous improvements in the process and equipment have been made. Higher speed casting machines, called moguls, have been obtained—by a design which reduces vibration and by the use of multiple-row (2, 3 and 4) depositing pumps.

The pump manufacturers now employ a principle of piston lubrication and packing which eliminates felt rings on the pistons and keeps them moist and sealed by constant immersion of the upper end of the piston in water. Accuracy of action and sanitation are improved. A competitive molding and casting machine is under test and scheduled for delivery this year. Also, there has been some development on machines for forming "hand-rolls" and other centers without the use of starch.

Two tedious operations in casting-machine operations are: Feeding the trays into the machine, and removing and stacking them at the end. Machines for stacking at the end are in successful use. Devices for feeding to eliminate all of the manual operations are being designed. One home-made apparatus in use does not entirely eliminate labor, but it does simplify work so that the job requires little strength and endurance.

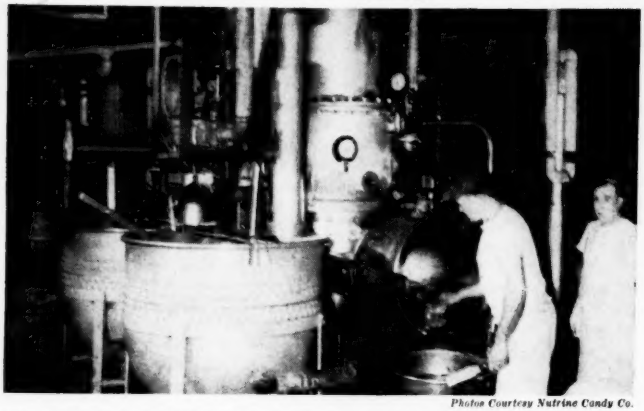
Casting starch is re-used, but after the product is "shaken out," the starch must be put through a cleaning and drying treatment. This treatment varies with the candy to be cast, but always should include sifting to remove small bits of candy, all foreign material, and lumps of starch. Sifting capacity must be adequate for the 15,000 lb. of starch per hour—the quantity of starch required to fill the trays at high-speed operations. Bypassing part of the starch, either for sifting or drying, is poor practice. Dual sifters are used instead.

Starch-Treating Units

For some candies, starch must be dried and heated—for others, dried and cooled. The same machine, commonly called a "starch drier," is used for heating and cooling.

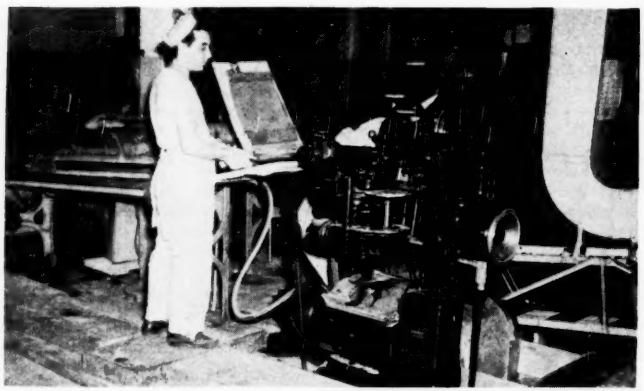
One type of starch-treating machine consists of large revolving cylinders through which the starch is passed. The cylinders contain tubes filled with steam or cold water to dry or cool the starch as it passes along and around them. Another type consists of a large number of troughs through which screw conveyors move the starch while jackets outside the troughs contain steam or cold water to change the starch temperature.

A well-known machinery manufacturer is now developing a cylindrical type with a novel heating and cooling



Photos Courtesy Nutrine Candy Co.

CONTINUOUS COOKING of hard candies is done at 300 deg. F. under 27 in. of vacuum—at rate of 3,000 lb. per hr. and to moisture content below 1 percent.



WRAPPING hard candies individually in moisture-resistant film. Machine shown forms, cuts, and wraps pieces of candies at speed of 500 a minute.

device. Regardless of what type is used, the capacity must be adequate to deliver starch to the mogul in ample quantity at the moisture content and temperature desired. Prewar installations often were inadequate.

Starch-cast candies are not the only ones molded into predetermined shapes and sizes. Hollow chocolate forms also are molded. For their manufacture, metal molds with highly polished surfaces are used to receive and shape the tempered chocolate mechanically poured or deposited into them. The molds are then passed through a cooling tunnel which solidifies part of the chocolate into a shell having the shape of the mold. The chocolate which still remains liquid is poured out, and replaced by a cream, jelly, fruit or nut-paste filling.

The bottom of the chocolate shell then is sealed with another application of tempered chocolate, which, in turn, is solidified by cooling. And finally, the candies are removed from the mold, ready for packing. This method of making molded confections is relatively expensive and restricted to novelty or specialty items.

New Cooking Installations

Thus far, attention has been given to such operations as coating, casting and molding, largely because those operations require the large machine units and have been favored with the more extensive improvements in their mechanization. Other phases of candy manufacture also have had their technological improvements.

For many years cooking has been done over gas fires or in jacketed kettles using steam at a pressure of about 100 psi. Vacuum has been used for some time to remove the moisture faster at a lower temperature and with less discoloration of the product through caramelization of the sugar. Although vacuum has been applied to a few new products, some new cooking installations use 150 lb. of steam pressure instead of reduced pressures. Development of continuous cookers is an interesting possibility, where the ingredients would be fed in, and the end product removed, continuously.

Making fondant for candy centers is traditionally a batch process, wherein the syrup is cooked, stirred, and cooled to produce the type of crystallization desired. There now are available machines which receive the hot syrup, beat it, and cool it in a continuous manner. These units reduce labor costs and permit an improved control over quality.

Revolving pans for pan goods now are made of stainless steel instead of copper, but no other striking changes are evident. At least one experimental continuous-polishing machine has been tried, but has not been made commercial—possibly because of the simplicity and low labor cost of existing panning operations. The charging and discharging of revolving pans is a laborious operation, which machine designers should simplify by relatively simple mechanical changes.

Packaging Is Being Mechanized

Candy packaging varies from semi-bulk packing to placing individual pieces of hard candy in heat-sealed, moisture-vapor-resistant packets. Packing of candies in layers inside boxes is still largely a hand operation. However, means have been developed for automatically placing the pieces on cardboard so that the packer can pick up an entire layer and place it in the box. Also, there are devices which permit a packer to place two pieces of candy in bon bon cups simultaneously instead of only one per motion cycle.

Wrapping of candy bars has been almost entirely mechanized. The bars are manually fed into wrapping machines from the extension of the cooling conveyor beyond the cooling tunnel. Packing the wrapped bars in boxes also is a manual operation. Two general types of bar wrappers are in use: (1) Those using a cardboard as the base for the package, and (2) those forming a tube of the wrapping around bar, without using cardboard.

Bar-wrapping machines which require cardboard now are equipped with cardboard cut-off attachments. This device supports a large roll of cardboard and automatically feeds and cuts off the proper length for each bar. The cost of separate shearing operations is eliminated. Also, the attach-

ment will feed a thinner board than can be handled by the manual feeder which takes pre-sheared pieces. One manufacturer's feeder corrugates the cardboard to give greater strength. Boats having sides can be formed by adding some side-folding parts.

Speeds of both types of machines vary from about 100 to 140 bars per minute. Like all automatic machinery, consistent mechanical service is advisable to maintain high productivity. The chief hoped-for development is ease of changing the wrapping machines for bars of different dimensions to give flexibility and eliminate the need for a separate machine for each size of bar. The design problems must be solved before such size changes can be made in a matter of minutes—hours at most.

The last 15 years have been fruitful in the development of high-speed caramel and hard-candy wrapping machines, operating at 500 pieces a minute. It is doubtful that speeds will be much further increased, except possibly by multiple operation in which two or more pieces are wrapped simultaneously on the same machine.

Machines for filling candies into boxes and bags are in common use. A needed improvement on some models is greater accuracy to avoid overweight packages. The use of cellophane for bags containing candy enables the candy manufacturer to make his own bags economically. A number of such machines are in use. Most of them draw the cellophane from rolls, pass it over forming devices, take it through heat- or glue-sealing units, then cut off the bags.

Sealing of these types of bags after filling usually is done by heat. Rotary sealers have replaced many of the reciprocating jaw sealers. The result has been reduced labor costs. Preheaters are necessary to warm the cellophane before it reaches the rolls. If the cellophane is cool, the rolls must be so hot to secure a seal that the cellophane will be scorched.

Machines for wrapping boxes in cellophane operate fully automatically at speeds up to 90 per min. Some progress has been made in adjustability, but parts must still be removed and replaced when changing sizes. Hand wrapping or semiautomatic equipment often is the most economical for a limited volume.

The employment of instruments has been mentioned earlier. However, the confectionery industry has been behind the chemical industry in instrumentation. In an effort to reduce human skill in routine operations, it is likely that instrumentation will show the progress in the use of—

1. Recording thermometers on all the heating and cooling operations.

2. Thermostatic devices to control conditioned air temperatures, temperatures of cooking, coating, and all other operations using heat.

3. Weight-control instruments for supply and mixing of material.

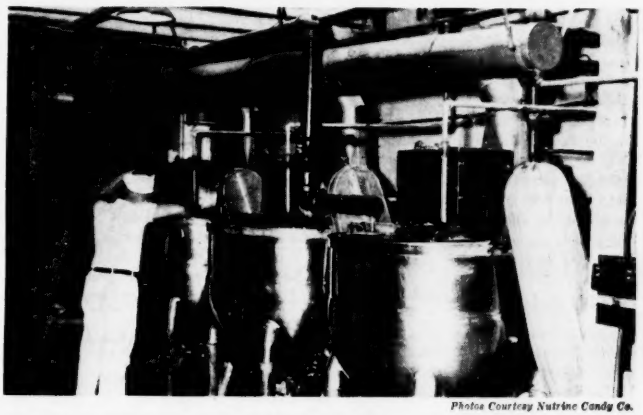
Federal, city, and state health authorities are insisting on a high degree of cleanliness. To obtain this desirable objective, new buildings have tile or other easily washable walls and vermin-proof floors with adequate drains. Machinery has been streamlined, provided with mechanisms designed to eliminate lubrication drippage, and equipped with parts that are readily accessible for cleaning. Machines for cleaning include scrubbers and vacuum units with high suction.

The National Confectioners' Association has a full-time sanitation expert who advises member companies and also conducts training schools for factory supervisory personnel at various geographic centers.

Continual research is carried on, chiefly by suppliers but also by the industry, in candy materals. Several developments are in more or less successful use. Vegetable albumen is competing with egg albumen. Dried milk is competing with condensed milks. Vitamins are added to a very few candies. And if the addition of vitamins is acceptable to the consumer and financially profitable to the confectioner, the next logical step would be the addition of minerals to aid consumers in obtaining proper diet.

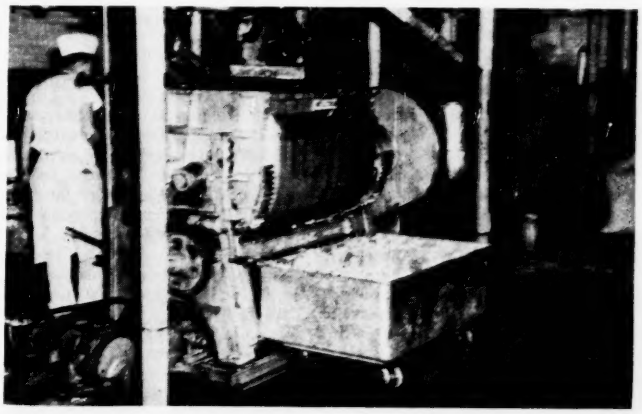
As the public has become nutrition conscious, there has been a growing

Batch Units Redesigned for Better Performance



Photos Courtesy Nutrine Candy Co.

CANDY MIXES to be cast in starch are now cooked in jacketed stainless steel kettles, provided with agitators, covers, and overhead vapor ducts.



JACKETED double-arm mixers replace shallow water-cooled plow-type beaters and materially lower the cost of fondant making.

demand for lower carbohydrate and higher protein content in candy. So candy manufacturers have been making greater use of nuts, dairy products, and vegetable proteins. Also, there has been a greater use of fruits (in as natural a state as possible) to obtain greater nutritional values.

A perennial hope of all chocolate men is the development of a coating which will not "bloom" or become soft in summer temperatures, and yet which will sacrifice nothing in flavor. Progress in the chemistry of fats and oils in other fields encourages hope of an eventual solution.

Material Usage Control

Narrowing profit margins necessitate careful analysis and control of raw materials usage. Materials, including those used in packaging, constitute over half the confection maker's sales dollars. Weekly or even daily analysis of usage, especially of higher priced materials, will yield large returns—provided the figures are shared with foremen and used to correct losses. At current prices, the use of 10 percent too much chocolate puts most bar operations in red ink.

Ample scales and ample labor for weighing and controlling materials are good investments, provided corrections are obtained. Positive-displacement pumps for liquids and vibratory feeders for free-flowing solids are devices which are used in the chemical industries for accurate proportioning. Their use in candy batch set-ups, or continuous processes, should be considered. Meters for all meterable liquids should both control quantities used and record the accumulated totals. All workers must realize the importance of accuracy in raw material measurement and the unpleasant consequences of waste if the curve of production costs is to be kept under control.

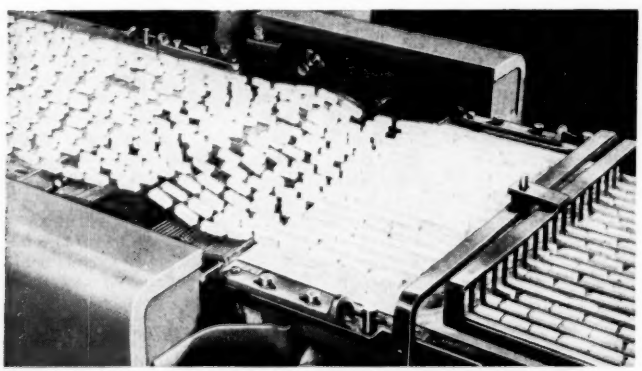
Most candy factories have laboratories. Some are excellent. Others occupy space not usable for any other purpose. Here again, a lesson may be learned from other industries, where the quality of the product is kept under laboratory control.

Such a practice results in consistent quality for the consumer, obtained by: (1) Formulas worked out by a trained chemist, supplemented by practical candy-making know-how; and (2) laboratory checks on all operations to determine freshness of material, proportion of ingredients, pH values, moisture content, fineness of particle sizes, appearance of final product, reliability of protective packing, shelf-life, and accuracy of weight as delivered for shipping.

Chambers in which temperature and humidity can be varied to simulate weather conditions in any part of the world are musts in any good laboratory. Another war-born technic is statistical quality control, which employs scientific sampling to give the most accurate representation of the quality of plant output for minimum expenditure.

Personnel Policies

In common with all industry, most candy manufacturers improved personnel policies and practices during the war to attract and keep employees, as well as to minimize labor unrest. Nearly all such programs will be simplified. Recommended for retention are: (1) Practical selection technics, (2) training of employees in method of doing the job, (3) training of foremen (not in abstract theories but in facts about the business of which the foremen are a part), (4) follow-up of new and old employees to uncover grievance sources, (5) interview of employees who leave voluntarily (the object again being to discover grievance sources), and (6) insurance programs.



PRE-BOTTOMER. Centers (left) are fed to wire belt (center), where they are bottom-coated. Candies cool on belt that goes over cooling table (right).

Pension plans probably will be kept, but any extension or any new ventures in this field should be examined carefully to be certain the business can carry the financial burden during a period of depression. Employee feeding methods which operated at substantial losses during the last seven years should be put on a break-even basis. As labor supply improves and labor turnover drops, the work of carrying out the suggested practices will be greatly reduced and will result in a substantial reduction in personnel department costs.

Bargaining collectively is an experience acquired by some companies during the last ten years. Employers, after accepting the union, can usually bargain in such a way that the future of the business is not imperiled. A desirable arrangement, both for labor and management, is that the union officials be members of the company's labor force and be interested in perpetuating the business for job security.

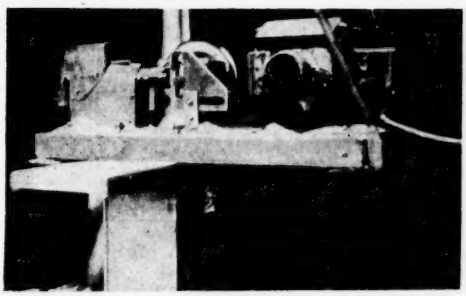
Toward Most Effective Way

Costs of labor per pound of candy rose faster than hourly wage rates during and since the war. This discrepancy must be corrected, not by wage cuts, but by greater productivity. This means application of time-and-motion study to develop the most effective way of running equipment.

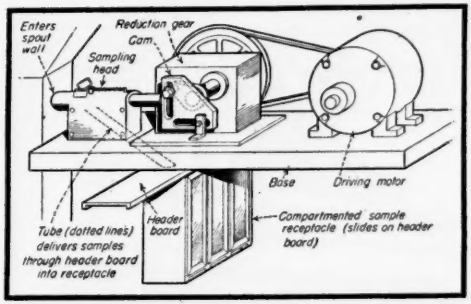
The use of wage incentives should follow. Along with good methods and good employee training, wage incentives, will result in high productivity and competitive costs. Such technics result in cost reductions of 15 to 50 percent from the performance of conscientious day workers using conventional methods. Smaller plants with modest equipment often can compete better than with highly specialized and expensive installations. Detailed motion studies often are better investments than machinery.

During the war, the maintenance of incentives often was based on a desire to keep workers on the job rather than on good wage incentive practices. As a result, many incentive standards are too high compared to other jobs—and certainly too high to be competitive. Since good practice guarantees standards when once established, reducing those that are out of line on the high side poses a problem. Mechanization and other simplifications of the job may give management a good excuse to reduce standards, but such moves are hardly satisfactory to the worker whose take-home pay is cut.

Budgetary control employing standard costs has demonstrated its usefulness in controlling material, labor and overhead costs. It is a tool which will be kept.



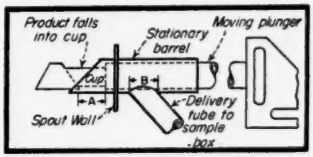
THE UNIT at work, taking samples from chute (left).



FOUR component parts comprise the sampling apparatus.

Device Automatically Samples Dry, Flowing Materials

From a falling stream—such as grain—1 oz. portions are taken at intervals to give composite sampling



DETAILS of plunger assembly—in thrust position to receive sample. Backward motion of plunger moves cup opening (A) to match delivery tube (B), thus dropping sample into box.

WALTER C. WHEELER
Grain Supervisor, Grain Branch,
Production & Marketing Administration,
U. S. Department of Agriculture, Omaha, Neb.

Sampling of commodities like wheat, flour, rolled oats, corn grits, corn meal and cereals has been greatly facilitated by an automatic sampler which was developed for government use during World War II.

Moreover, the sampler might well be adopted for use with other free-flowing foods, such as dried milk, dried eggs, dry soup mixes, and the like.

Motor-driven, the sampler may be set to operate on a predetermined cycle to remove periodically small quantities of a free-flowing material from a bin, chute or spout.

The device can operate over a period of several hours, or as long as a mill is running, in order to obtain a representative sample of the entire run. It is particularly useful for systematic sampling of products during evening, holiday, or Sunday operations when fewer employees are on duty.

Mechanically, the unit consists (see drawing) of four parts: The sampling device, a reduction gear, a motor, and the sample receptacle box. The sampler, gear and motor are mounted on the top side of a 2x12x21-in. base, which may be fabricated of either metal or wood.

A 6-in. long, 1-in.-dia. delivery tube connects the sampling device and the receptacle box. The receptacle is suspended beneath the base by a header board attached transversely to the base and long enough to support a sample box of several compartments. Incorporated in the header board is a grooved fitting so that the box can be slid along to bring the various compartments into position, while protecting the contents from dust and atmospheric humidity.

The box inself can be built for any desired capacity and divided into sections or compartments so that samples from different lots or running periods may be kept separate.

Each compartment is fitted with a transparent panel so that the mill operator or department foreman can check on the contents and make certain there is no clogging. In addition, the sample box may be fitted with seals to prevent tampering with contents.

Plunger Inserts Into Chute

The sampling device is comparable to a grain trier. It consists (see drawing) of a slotted hollow plunger operating reciprocally in a tube or cylinder approximately 6 in. long and of 1½ in. dia. This cylinder is mounted horizontally on a block bolted to a wooden base. The forward or muzzle end protrudes about 2 in. beyond the block mounting so as to permit insertion through the wall of a chute, spout or bin in order to intercept the flowing material. In the underside of the cylinder is a hole of 1 in. dia. connecting with the delivery tube discharging into the sample box.

Samples are obtained as the slotted plunger slides back and forth (with a 2 in. movement) inside the mounted cylinder. The slot near the front end of the plunger is cut through with a top length about twice its bottom length and at a 45-deg. angle from the top front edge to its bottom edge.

When the plunger, operating through the reduction gear on an eccentric, is at the full extent of its forward movement, the slot on its top is about 1-in. beyond the front or muzzle end of the mounted cylinder inside the wall of the bin, chute or sprout. This protrusion of the slotted plunger forms a cup and permits the material being sampled to fall into the opening, and to be drawn back through the cylinder by the backward stroke of the plunger. Then when the plunger is at the full extent of its backward movement, the bottom opening of the slot matches the discharge hole in the cylinder wall thus permitting the sample material in the slot to drop through the short delivery tube into the sample box.

Design of this slotted plunger affords additional advantages. The shape of the slot and the position of the discharge hole in the cylinder wall causes the nose of the plunger to close the end of the cylinder inside the spout or bin before the bottom opening of the slot reaches its position over the discharge hole in the cylinder. And this time interval prevents any blowing through of an unmeasured portion of the material being sampled.

Moreover, clogging or packing of the sample in the slotted plunger is prevented by a finger-like device posi-

(*Turn to page* 209)

New Court Rulings Clarify Your Legal Liabilities

Ranging from A to U—Adulteration to Unfair Competition—recent higher court decisions offer timely guideposts in all fields of the food industry

LEO T. PARKER
Attorney at Law,
Cincinnati, Ohio

Recently a reader wrote: "If a manufacturer of food properly packs and ships his product to a seller, who is liable if the shipment is damaged during transportation?"

According to a higher court ruling, the buyer must assume loss of merchandise shipped f.o.b. the seller's location.

In Joseph Martinelli & Co. Inc., *v.* L. Gillarde Co. (73 Fed. Supp. 293, reported Oct. 1947), it was shown that cantaloupes were shipped to buyer "f.o.b. rolling acceptance final". The higher court held that title to the cantaloupes passed to the buyer at the point of shipment and, from that point, all risk of normal deterioration and damage in transit fell upon the buyer.

Trademarks

The law specifies that trademarks of food products must be "affixed" to the goods. But according to a recent higher court, a trademark need not be affixed to small or individual packages of the goods.

For example, in Barron-Gray Packing Co. *v.* Bruce's Juices, Inc. [162 Fed. (2d) 217, reported Aug. 1947], it was shown that a company registered a trademark to be used on canned fruit and vegetable juices. However, the company used the trademark *only* on the fiber board cartons in which are packed two or four dozen small cans of its fruit juices. The registered mark has *never* been used on the cans.

A competitor contended that the trademark was rendered void because the company failed to use it on the cans of the food product as well as on the cartons.

The higher court refused to agree, and held that a trademark is deemed to be "affixed" to an article when it is placed in any manner in or upon either the article itself, or the receptacle or package with which the goods are packed or otherwise prepared for sale or distribution.

Unfair Competition

The law books are full of decisions holding competitive manufacturers of food products liable in heavy damages for imitating an original trademark label, or design, if the imitation *is likely to confuse* or deceive the buying public into believing that it is purchasing a product marketed by the originator when, in fact, they are purchasing the competitor's product. On the other hand, there is no principle of law more firmly settled in the law of trademarks than the following: Words, colors and phrases which have been in common use can be printed on containers without any liability of the new user if the originator is not damaged.

For example, in Scudder Food Products, Inc., *v.* Ginsberg [126 Pac. (2d) 674], it was shown that a manufacturer adopted for packing butter a carton that a competitor alleged violated unfair competition laws. In subsequent suit, the higher court refused to hold the competitor liable, and said:

"Both have a dark navy blue background. Both have lettering in gold. Each has the word 'Butter' printed thereon. There is not another similar feature. Each label has some printing in red, some in black, some in white."

Also, it was contended that the manufacturer was guilty of fraud because he had printed in large figures, in a flaming red color, "25 cents" on each package, but he instructed dealers to sell same for 15c. In refusing to hold the manufacturer liable, the higher court said:

"Such conduct is, we think, a trade practice of which no one may complain."

Arbitration Clause

If contracting parties agree to "arbitrate" their legal differences, neither party may file a suit.

In Trubowitch *v.* Riverbank Co. [182 Pac. (2d) 182], it was shown that a buyer made a written contract to purchase 3900 cases of No. 10 tomato paste. The contract contained the following provisions: "Any controversy arising out of this contract shall be settled by arbitration in New York, Chicago or San Francisco."

The seller failed to deliver the merchandise. In subsequent litigation, the higher court held that neither party can file a suit nor ask a court to settle the controversy.

Adulteration

In United States *v.* 36 Drums of Pop'n Oil [164 Fed. (2d) 250, reported Jan. 1948], the Wil-Kin Theatre Supply sold mineral oil for popping corn, which was made to look like melted butter.

The government agents confiscated the oil on the grounds that it was "adulterated," under the federal Food, Drug & Cosmetic Act, *by having its inferiority to butter concealed,* and by imitating butter without the sellers of popcorn notifying the public that it was imitation butter.

The higher court upheld to the validity of the condemnation and confiscation proceedings, saying that mineral oil in the gastro-intestinal tract absorbs a very large quantity of carotin, which is the chemical substance that the body uses to synthesize vitamin A. This court said:

"It is a matter of common knowledge that, for use as food, melted butter is superior to mineral oil."

According to a recent higher court, public officials cannot decide what ingredients constitute adulteration. A state or U. S. law must define the term.

For instance, in Margolin *v.* State [205 S.W. (2d) 775, reported Jan. 1948], it was disclosed that a state law prohibits sale of any article of food that is adulterated. The state health officer prohibited the use of saccharin in bottled soda water.

A soft drink manufacturer was fined and convicted of violating this state law because he used saccharin as a sweetening agent to displace 3 percent of the sugar content in a soft drink. The higher court reversed the verdict, saying:

"The Legislature has not prohibited, by name, the use of saccharin in the manufacture of bottled soda water."

Hence, this court held that it is invalid for any public official, or the Board of Health, to decide that a mere non-injurious substitute of food is "adulteration."

For comparison, see McKenzie *v.* Peoples Baking Co. [31 S. E. (2d) 154]. Here, a state law provides that an article of food *is* adulterated if any substance has been mixed with it so as to *reduce or lower or injuriously* affect its quality or strength.

A woman purchased a cake from a bakery company and, when attempting to eat it, her gums were cut by a sharp piece of steel embedded in the cake.

In holding that the bakery had violated the law, the higher court said: "The steel was a substance mixed with the cake, a food, which 'reduced or lowered or injuriously affected its quality.' "

Federal Statutes

The federal Food, Drug & Cosmetic Act authorizes federal agents to condemn food unfit for human consumption. According to a recent higher court, the federal law is superior to such laws as the Renovated Butter Act of Alabama.

In United States *v.* Butter [148 Fed. (2d) 365], the testimony showed that a company in Alabama began to make renovated butter out of stock that was filthy or putrid, in the hope that it would be purified in processing. The federal authorities condemned several thousand pounds of this "butter."

The company officials argued that the federal authorities had no jurisdiction in view of the Alabama Renovated Butter Act. The higher court refused to agree with this argument, and said:

"If Congress wanted to encourage the making of packing-stock butter out of any materials that the manufacturers can get hold of in reliance on their claims that no matter how filthy the ingredients, the finished products will be pure, or the impurity can be, or will be, detected, it could, of course, take package-stock butter out of the Food & Drug Act."

It is important to observe that the court stated that under certain circumstances a renovating process is practical and that renovated butter may be good butter.

Another important point of law is that the federal courts will not approve a condemnation verdict based on a "smell" test of butter. In other words, a valid condemnation suit must be based on an analysis made by a competent chemist [see 142 Pac. (2d) 192].

Disfigurement

According to a recent higher court, an employee who is disfigured but not disabled *cannot* receive compensation under the State Workmen's Compensation Act.

In Lloyd *v.* Minnesota Valley Canning Co. [28 N. W. (2d) 697, reported Dec. 1947] an employee in a canning plant sued for compensation for personal injuries resulting only in disfigurement *not* materially affecting her employability. This higher court refused to award compensation.

Criminal Record

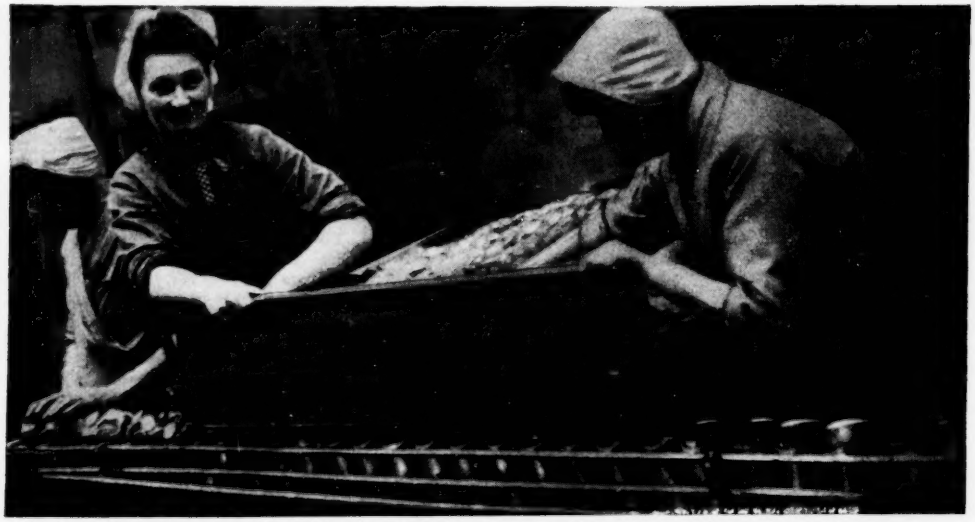
A plan recently was developed, by certain officials of food manufacturers, designed to avoid or reduce damage allowances to consumers who sue for alleged injuries caused by unwholesome beverages. This plan is the introduction of proof that the consumer previously was convicted of a criminal offense.

For illustration: In Gantt *v.* Columbia Bottling Co. [29 S. E. (2d) 488], a consumer sued a bottling company to recover $2,000 damages alleged to have been sustained as a result of drinking from a bottle, which he claimed contained bluestone. The lower court held the bottling company liable for $2,000 damages.

However, the counsel for the bottling company appealed to the higher court and proved that the consumer had previously pleaded guilty in the U. S. District Court to violation of the Internal Revenue Law relating to distilling whiskey with intent to defraud the U. S. of the tax imposed on such whiskey. In other words, the consumer had been convicted as a "moonshiner" of whiskey. In view of this testimony the verdict was reduced to $200.

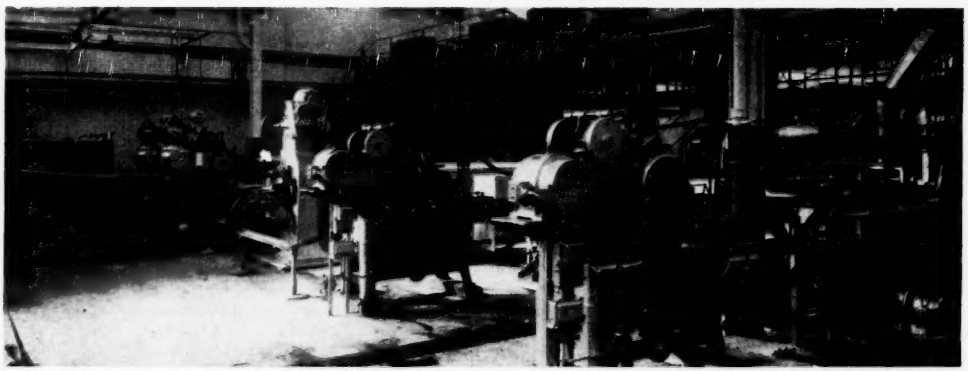
(*Turn to page* 198)

The English have had to improvise . . .



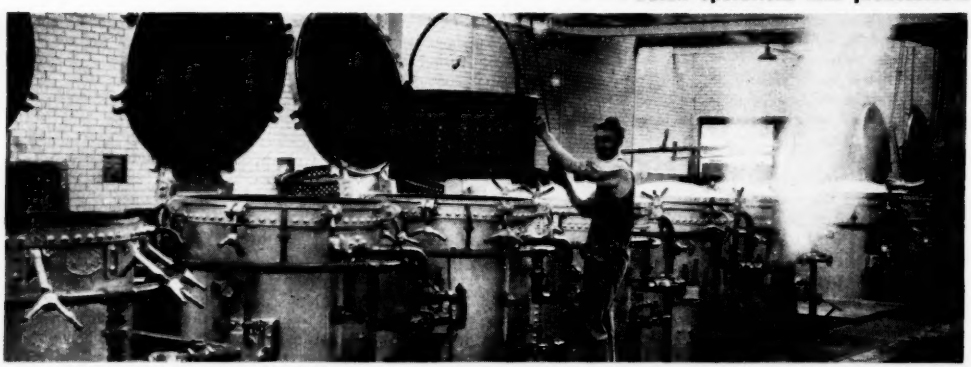
THIS FILLING DEVICE was contrived to solve difficult problem of getting non-free-flowing rhubarb into cans.

. . . and though continuous lines are coming in . . .



AUTOMATIC EQUIPMENT is used in pea cannery. Can seamers (foreground) are followed by exhaust boxes and fillers.

. . . batch operations still predominate



STERILIZING crates of canned food under steam pressure. Crates are handled in and out of retorts by electric hoist.

British Food Processors Make Best of Bad Situation

They strive to meet cannery and fishery problems, with operations which often differ from those in the United States—Part II

JOHN H. NAIR
Assistant Director of Research,
Continental Foods, Inc.,
Hoboken, N. J.

Note: First-hand observations of the dairy, livestock, and meat packing branches of the British food industries, particularly pointing out the restrictions and difficulties under which they operate, were presented by the author in the first installment of this two-part article (Jan. FOOD INDUSTRIES*). Here, he concludes his revealing account with timely details of operations in the canning and fisheries branches of the industry, as well as in the food research institutions.—The Editors.*

Judging from the present operations, the British have never carried out local canning of fruits and vegetables on a scale approaching that found in our country.

As for small fruits, climatic conditions are not favorable for ripening. And as for vegetables, the Englishman has been accustomed to getting along with those that are in season. This explains the universal consumption of cabbage and Brussels sprouts in the British Isles during the winter months.

Comparison With Canada

The scarcity of out-of-season vegetables—they are practically unknown in English markets—is a situation similar to that existing in Canada when, in 1947, importation of fresh vegetables from the U. S. was banned.

On the other hand, there is a large-scale vegetable canning operation carried out in England that is unknown in the U. S. This operation is the canning of field-dried green peas. They are sorted, blanched, canned, and retorted at the rate of millions of cans annually. It is customary to add artificial color and mint flavor to these peas, which sell at a very low price in heavily populated industrial areas. The product is rather mealy—none too appetizing to those familiar with canned fresh peas.

The current demand for foodstuffs and the great reliance on domestic crops were evidenced by the rather large current production of rhubarb and carrots in whole, sliced, and diced form. During the growing season, small quantities of plums, peaches, pears, and small fruits are packed. However, the supply of such fruits is extremely limited.

Some canning plants seem well equipped, with production streamlined in a manner comparable to best American practice. While batch retorts are generally employed, several installations of continuous sterilizers similar to Anderson-Barngrover equipment, were seen. In order to save paper, the regulation is that only strip labels can be used on cans. These are applied with high-speed labeling machines. Automatic casers are beginning to make their appearance.

Another interesting item not seen in the U. S. is the tea spread or paste for bread. Due to the Englishman's universal practice of afternoon tea, there is a heavy demand for spreads other than margarine, which is limited by the fat shortage. These spreads may have a fish base or meat base, or a combination of several meats. After compounding the ingredients—including some potato or wheat flour—the hot paste is filled into 3-oz. glass jars that are capped and sealed before they are sterilized in retorts. After processing, the jars are belt-conveyed to a labeling machine and then to a casing operation.

Canned soups constitute one of the standbys in England as well as America. Tomato soup is the leading variety. No puree is manufactured in England. Tomato concentrates are imported from Holland, Italy, central Europe and the Argentine. Quality is variable, but generally poorer than puree put up in America.

Quality Difficult to Control

Processing methods are similar to those in America, but batches are much smaller and the final products are more variable. This variation arises from shortages and differences in the quality of materials, with the result that it is difficult to control quality. Fats, for example, are whatever may be allocated by the Ministry of Food at the time. Lots may vary widely in composition and quality.

Some meat-broth soups are manufactured, while vegetable soups in several styles are quite common. The size of the standard can used is the same as that common in the States. Certain varieties, such as tomato soup, come ready-to-serve. Others, such as oxtail or Windsor (vegetable) are partly concentrated, but much less so that the corresponding American canned soups.

Fishing Industry Methods

The handling and marketing of fish in England differs from U. S. methods. Most of the fish is delivered by trawlers to ports at Hull, Grimsby, Aberdeen, Fleetwood and Milford Haven.

There are two types of trawlers. Large vessels (135 to 170 ft. long) fish at Iceland, Bear Island and in the White Sea — even occasionally off Greenland and the Newfoundland banks. Smaller trawlers (100 to 120 ft. long) fish in the North Sea and West Coast waters.

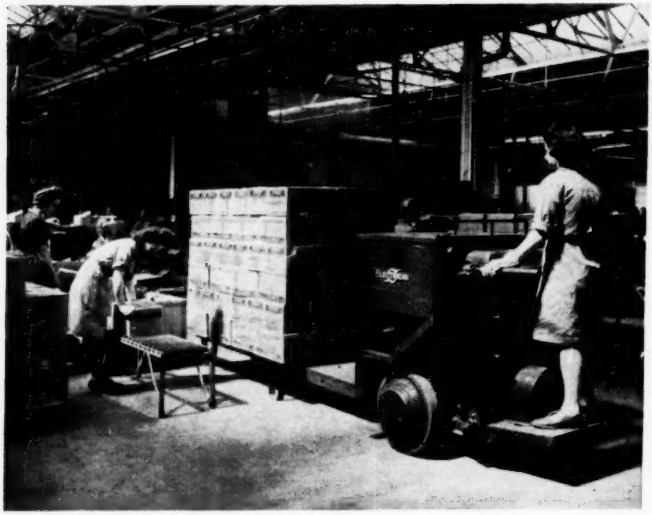
During one early morning's visit at Grimsby, a trawler just arrived from Iceland and unloaded half a million pounds of fish. The trawlers, on which catches are preserved with cracked ice, may be away from port for two to three weeks. The many varieties of fish are sorted according to kind, and they are sold to wholesalers at the various ports.

The Ministry of Food has established maximum prices for all varieties, and most of the fish is allocated to wholesalers at these prices. When, as sometimes happens, no buyers can be found at maximum prices, the fish is auctioned to the highest bidder. Trawler owners at each port have laid down minimum prices, below which fish will not be sold for domestic consumption. When these minimum prices cannot be obtained, the fish is processed into fish meal in factories that are located at all the main ports.

There are also important white fish landings from smaller inshore vessels at many coastal ports. These white fish—such as cod, haddock, and plaice—account for about 70 percent of the total landings. Also, important herring fishing is carried out by steam drifters (about 80 ft. long) and motor drifters (60 to 80 ft. long). Principal herring ports are Fraserburgh, Peterhead, Stornoway, Lerwick, Yarmouth, and Lowestoft.

Since the end of war, there has been considerable development in the production of frozen fish, and about 20,-

Materials Handling Methods Are Up-To-Date



ELECTRIC LIFT TRUCKS are used at Batchelors' pea cannery to facilitate transfer of pallet loads of cased goods to storage areas or to the shipping dock.

000 tons had been processed in 1948. When fish is being sold at maximum price, the Ministry of Food grants special allocations to freezing plants. The frozen fish production, of course, is still insignificant in relation to total fish sales, which amount to about 1,000,000 tons a year.

The bulk of the fish consumed in this country is dispatched fresh from the ports every day, reaching the retailers in all parts of the country the next morning.

Apart from herring, which are mostly frozen whole, fish that is frozen is filleted at the ports in the same way as in Canada and the U. S. There is a great shortage of the better varieties of fish, such as Dover sole, turbot, lemon sole and plaice.

Fish an Important Part of Diet

Because the weekly meat ration amounts to about $0.20 worth per person, and since other protein foods such as eggs and cheese are also short in supply, fish has become more important than ever in the English diet. Fish is served boiled, broiled, or baked with almost every meal. Due to the shortage of fats, the frying of fish has been greatly curtailed. However, there are still good supplies of fats available for the "fish and chips" shops that are commonly found throughout the country.

The freezing of fish has not been mechanized to the same extent as in Boston, Canadian, and Newfoundland ports. Practically all filleting is done by hand, mostly by male labor. It was reported that both American and German filleting machines were tried but have not been accepted by the British industry.

The main trade in frozen fish has thus far been for so-called institutional-packs. For retail purposes these packages are defrosted in retail shops and sold to the public. However, a promising start has been made with retail packs that are sold out of low-temperature cabinets by large stores, grocers, and fishmongers.

Fish Cake Production Mechanized

Manufacture of fish cakes is a large-scale business in England. They are produced mainly at Hull and Grimsby and in some of the larger towns. Total winter sales for fish cakes are well over a million a week. These cakes consist of 40 percent fish fillets and 60 percent mashed potatoes. They are dipped in a batter of rusk crumbs. Production of the fish cakes is highly mechanized. Selling prices are controlled by the Ministry of Food, the maximum price to consumers being three pence each ($0.05).

The Englishman has always liked smoked kippers for breakfast. Therefore, the smoking side of the fish industry is much more important in England than in the U. S. Herring for kippers are spit and cleaned mechanically with machines of German design, and they are given a short pickling in artificially colored brine. The split fish are then hung over nails on wooden stringers, which are racked by hand in the smoking tower.

The design of smokehouses and their operation follow the pattern established decades ago. An operator climbs up the inside of a narrow brick chamber two or three stories high to hang the stringers of fish. When the smokehouse is full, a sawdust fire is kindled on the floor and the doors are closed.

From time to time the fire is permitted to die down so that the operator may go inside the smokehouse to determine the condition of the kippers. Because of the smoke, the operator tests the kippers by feel, judging them on the basis of tenderness. Stringers are removed that are considered ready. The remaining ones are rearranged, the fire is then rekindled, and smoking is continued.

Smokehouses Need Redesigning

Through repetition of this cycle, all the kippers are eventually smoked. Uniformity of the product varies with the skill, experience, and attention of the operator.

Some attempts are being made to improve this uncomfortable and highly variable smoking process. The Torry Research Station in Aberdeen, which carries out fisheries investigations under governmental and industrial auspices, has devoted considerable time to the study of improved methods and arrangements for smoking. Two of the major problems encountered are: (1) Reproduction of color and flavor, and (2) telescoping of space and time requirements to make possible a continuous process.

A new, more accessible design of smoking chamber has been worked out at the Torry Station. However, its introduction into commercial production of smoked kippers is a matter for the future.

Quick-Frozen Products

Distribution of quick-frozen fruits and vegetables is mostly a postwar development in England. Lever Brothers & Unilever, Ltd., has entered the field through a subsidiary company, Birds-Eye Foods, Ltd., in which General Foods is also interested. Birds-Eye Foods operates, at Yarmouth, the largest quick-freezing factory in Europe, and it also benefits through a number of co-packer plants which have been put into operation in different parts of England and Northern Ireland.

The greatest effort has been made on peas. In plant layout and equipment, the pea-packing operations are a close duplicate of Birds-Eye standard plant layouts developed in the U. S. Other vegetables that are being frozen are spinach, beans, cauliflower, broccoli, and Brussels sprouts. Frozen fruits include strawberries, blackberries, black currants, cherries, blueberries, plums, and raspberries.

Distribution difficulties arise because of the small number of low temperature cabinets available in outlet stores and the comparative absence of deep-freeze cabinets in the homes. Retail prices for frosted foods are quite high by British standards. These prices restrict the volume of sale even more than the limited plant capacity and available raw materials. Quick-frozen fish products, however, constitute an exception.

Food Research Institutions

In England, joint research programs in many fields are undertaken as cooperative efforts between the government ministries and the privately owned companies of an industry. Among such organizations are the Cereal Research Institute, Iron & Steel Research Institute, and Leather Research Institute.

Other types of research centers are those that are operated entirely by the government, such as the Torry Institute, the Low Temperature Station at Cambridge, and the National Institute for Research in Dairying at Shinfield.

Under the direction of Dr. Bate-Smith, the Low Temperature Station has conducted a number of investigations important to the food industry. A great deal of work was done at this station ten years ago on the chilling and refrigerated storage of fresh meat. Some of the work was reported by Dr. T. Moran at the first symposium on Food Technology held at Boston, Mass. in 1937.

During World War II, food dehydration was a subject of important investigation. A standard tunnel dehydrator was designed, and many of these units were built for drying potatoes and other vegetables in different sections of England. Considerable research was done on rates, pressures, and temperatures involved in the vacuum-freeze drying of foods. However, no commercial developments grew out of this endeavor.

The oxidation and deterioration of edible fats has long been a major project, and many findings have been published by Dr. C. H. Lea and his coworkers. Assistance is being given at the present time in the freezing of eggs, imported from egg-breaking plants in Norway and Poland.

Improvements Made in Dairy Field

The National Institute for Research in Dairying extends its investigations into all aspects of dairying, with research units covering animal husbandry, crops and feeding, farming, plant equipment, physiology, bacteriology, nutrition, and manufacture of dairy products. Dr. H. D. Kay, the director, has assembled an able staff of investigators, several of whom have world-wide reputations.

Dr. T. W. Scott Blair, the well-known rheologist, has developed ingenious instruments that are used to manufacture cheese. One of these has been used for some time by the Kraft Co. in England, and it is soon to be adopted by plants in the U. S. This instrument is designed to determine the "pitching point" for the end of the cook. Other instruments measure the properties of finished cheese.

A valuable development by Dr. A. P. R. Mattick at the Reading Station is the use of an antibiotic for the treatment of cattle mastitis. A single innoculation with this antibiotic has completely cured 95 percent of the diseased cows treated. In this respect, it has proven much more effective than the antibiotic, penicillin. If further tests confirm these results, it is estimated that countrywide adoption of the treatment would increase total milk production 20 to 25 percent.

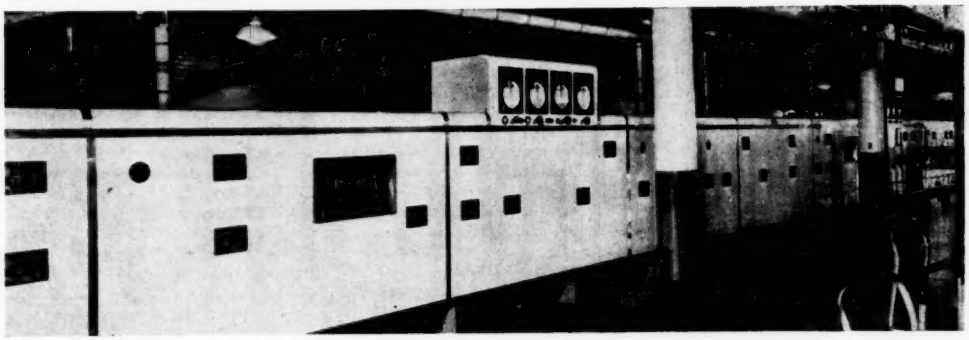
To Sum It Up

In many respects, the application of food technology in England today is some years behind the U. S. This is due partly to innate conservatism, which tends to balk at the novel when the familiar will serve. But lack of information on improvements which have been adopted in the United States and Canada is also another important factor.

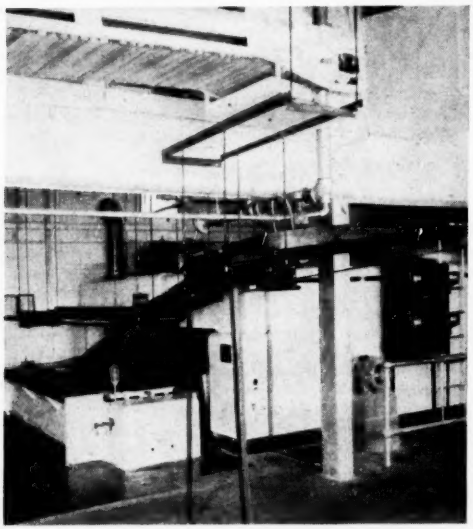
Mostly, however, the present day situation in England is an uneven one veering between strict modernity and well-worn usage, a result traceable to restrictions, shortages, and insufficient manpower. On the whole an extremely good job is being done under difficulties which the American food manufacturer would find extremely burdensome to put up with even during peacetime operations.

ATTRACTIVE SETTING features Trufood Limited plant, which is a modern structure located at Wrenbury, England. Building is equipped with latest processing units for receiving, pasteurizing, condensing, and drying milk products.

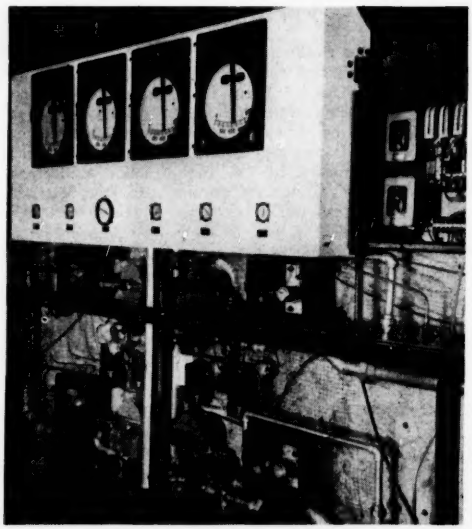
Types of Bake Ovens, Controls Employed, and Methods of Heating



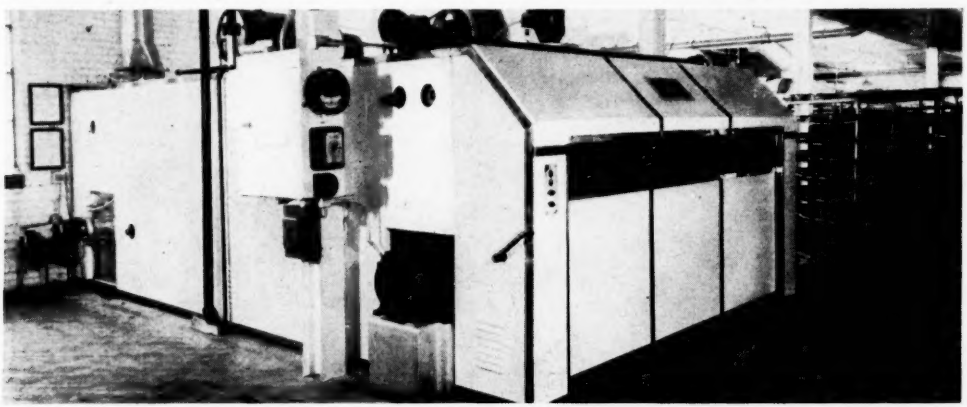
DIRECT-GAS-FIRED tray oven, with four zones controlled by pneumatic proportional controllers.



DELIVERY end of gas-fired traveling hearth oven, with panel of four millivoltmeter controllers at right.



INSTRUMENT BOARD, with oven side panels removed to show four pneumatic valve actuators.



MULTICYCLE oil-fired tray oven. Circular case thermometer controller is on post (left center). Oil burner is at rear.

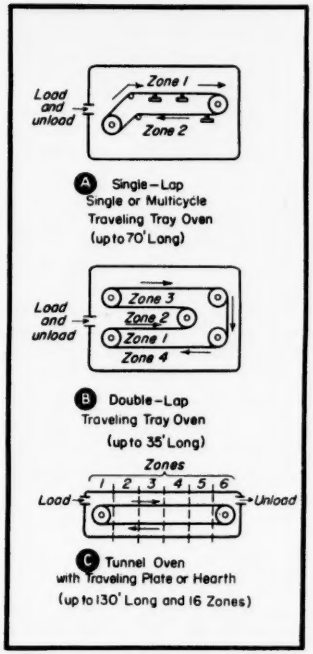

Load and unload
Zone 1
Zone 2
A Single–Lap Single or Multicycle Traveling Tray Oven (up to 70' Long)
Load and unload
Zone 3
Zone 2
Zone 1
Zone 4
B Double–Lap Traveling Tray Oven (up to 35' Long)
Zones
1 2 3 4 5 6
Load
Unload
C Tunnel Oven with Traveling Plate or Hearth (up to 130' Long and 16 Zones)

FIG. 1. **BASIC** semi-continuous and continuous ovens (side views).

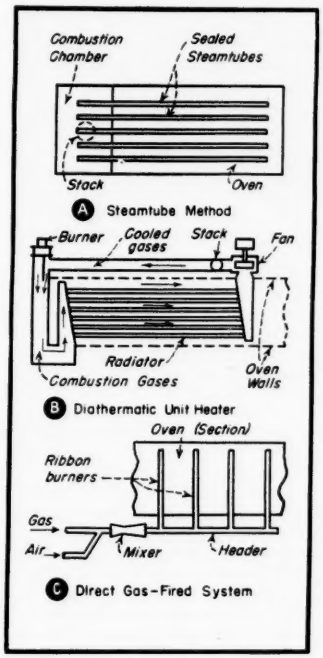


FIG. 2. **SYSTEMS** for heating, shown in schematic plan views.

Control Improvements Feature Latest Bake-Oven Practice

Optimum temperatures through controls assure uniform quality, speed processing, and eliminate spoilage

E. O. ENGELS
Chief Engineer, Baker Perkins Inc., Saginaw, Mich.

Twelve basic points for guiding a baker's production and merchandising policies are listed by the Program for Bakers Progress, formulated by the American Bakers Association at the close of World War II. Included are several worthy objectives pertinent to the subject of automatic control as applied to up-to-date baking ovens, namely:

1. That the equipment shall have all modern improvements,
2. That safety shall be practiced, and
3. That progress shall be checked regularly.

A consideration of present types of ovens and methods of heating, and of trends in the use of temperature controls and combustion safeguards, offers an excellent yardstick for the baker in gaging his position in this particular field.

Bake oven design is a vital factor influencing the selection of temperature controls. The smaller batch type ovens, such as the peel or draw plate units, are being replaced more and more by larger, semi-continuous traveling tray, continuous tray, or tunnel ovens* of the types illustrated schematically in Fig. 1.

Often used to bake a variety of goods, these units require greater flexibility in the control system. Multiple heating zones, moreover, necessitate closer control to provide the desired temperature gradients.

Control Speeds Process

The role of temperature control in newer ovens is given added importance with present-day demands for increased production from a given investment in equipment and man-hours. Optimum temperature levels not only assure uniform quality in baking but can speed the process as well. Spoilage due to underheating or overheating is virtually eliminated, and personnel are protected against the hazards of fire or explosions.

Three common heat sources employed (regardless of oven type), are: (1) Indirect heating with steam sealed in tubes, (2) indirect heating by combustion gases within tubes (such as the Diathermatic system), (3) direct gas-firing with ribbon-type burners. Individual units of these types (Fig. 2), are often used as separate heat sources for the individual zones of the oven.

Details of Heating Systems

The steam-tube design (Fig. 2-A) utilizes a high-strength tube inside which is sealed the liquid to be vaporized by direct heat applied to the small portion of the tube in the combustion chamber. The tubes are inclined at a slight angle toward the combustion chamber so that steam condensate returns to the heated ends to be re-vaporized. Any type of fuel may be used, since the combustion chamber is sealed from the oven.

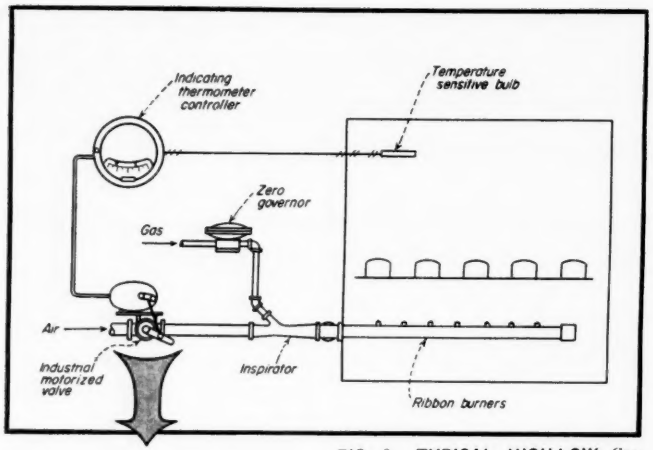
The Diathermatic system (Fig. 2-B) utilizes combustion gases from a burner which are mixed with cooled return gases and circulated within a sealed bank of tubes or radiator. A fan (installed as shown) draws the cooled gases from the tubes and returns them to the combustion chamber. To maintain a balance in the system, a portion of these gases is exhausted to the stack.

In the direct-gas-fired system (Fig. 2-C) gas and combustion air are mixed in a common header serving a series of long ribbon burners (similar to those in home ovens) installed across the width of the oven. One header usually serves from 4 to 10 such burners.

Of the various types of industrial temperature controllers available, three indicating models are frequently used on ovens, namely:

1. The millivoltmeter pyrometer with mercury switch contacts.

* Tunnel oven shown in Fig. 1-C is type used for bread baking. Type of traveling band or mesh oven for soda crackers and cookie baking is similar, with exception that turning points of conveyor are outside oven enclosure. Such ovens may be up to 350 ft. in length and have up to 20 control zones.



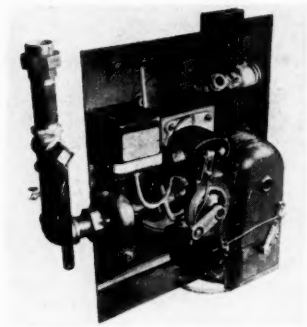


FIG. 3. TYPICAL HIGH-LOW Gas Oven Control System. Left: Integral gas burner unit with industrial motorized valve, safety shut-off valve, and combustion safeguard.

2. The circular case thermometer with mercury switch contacts.

3. The rectangular case thermometer with pneumatic proportional control (narrow band throttler).

Temperature indication usually suffices, but often bakers desire recording of the oven conditions. One modern plant uses a three-record strip chart electronic potentiometer to plot continuous records of oven temperatures on a panel board located in the assistant general manager's office. Such records provide a ready check and a permanent daily log of oven performance.

Electric vs. Pneumatic

The choice between electric contact control and pneumatic proportional control depends largely upon the burners to be used in the heating system. The control can provide (1) high-low, (2) on-off, or (3) modulating (proportional) regulation.

Both the thermocouple pyrometer and the circular case thermometer with mercury switch control are employed for either on-off or high-low type burners, the choice being somewhat arbitrary in accordance with the user's preference. The thermocouple type offers the advantage of a faster response to temperature changes and permits longer leads between the sensing element and the instrument which, in turn, permits the use of centralized panel boards.

The high-low system may be employed in any of the methods of heating previously described. The burners operate at high capacity when the controller calls for heat, and at a predetermined low setting when the heating requirements of the controller are satisfied. One system, comprising an electric contact controller and electric motorized valve, is used for each unit heater or for each header of multiple burners.

In a typical high-low gas control system (shown schematically in Fig. 3) a contact controller operates a two-position industrial motorized valve on the combustion air line upstream from the gas inspirator. The photo keyed to Fig. 3 shows a burner utilizing this valve incorporated in an integral unit which includes an ignition transformer and combustion safeguard with a safety shut-off valve.

On-off control is similar to high-low, except that the minimum is set to the off position on the gas or oil valve. When the controller calls for heat, the burner is re-lit and returns to the high setting.

A disadvantage of on-off control (as compared to high-low) is that it permits greater cycling of the temperature about the controller set point, particularly in smaller ovens with less heat capacity.

When oil is used as the fuel in an on-off system, the contact controller is often used to start or stop an electric motor driving the oil pump, thereby, in turn, controlling the flow of oil to the burner. In such a system, only a single contact (closed when the temperature is below the controller set point) is required to energize the electric motor.

A modification of the above system incorporates an automatic damper control operated by a two-position industrial motor with built-in limit switch.

The trend in modern baking ovens in recent years is toward pneumatic proportional control, whereby intermediate positioning of gas or oil valves results in more even heating. The narrow band throttler control in the indicating thermometer has definitely provided improved temperature control. It permits greater flexibility in the multiple use of an oven for a variety of baked goods.

The pneumatic controller is used, for example, in conjunction with a pneumatic valve operator on the combustion air line to a direct-gas fired oven (in much the same manner as illustrated in Fig. 3) for the high-low electric system. The lead photo—on the first page of this article shows four such pneumatic motorized valve combinations with adjustable port throttling valves. Similarly, the pneumatic proportional control is applied to oil burners by the use of a diaphragm motor valve on the oil line.

Temperature-Sensitive Element

The location of the temperature sensitive element, or elements, in any oven depends principally upon the design of the oven, the extent of heat lag from the source to the baking chamber, and the speed of the detecting element. In general, the element for each controlled zone is placed in the baking chamber at a point which responds fastest to load changes and where the greatest heat variations exist.

Care must be exercised that one oven section is not oven-controlled by another because of the element location. The transition from a high-heat section to a lower section should be gradual and controllable at any setting of the burner. An aid in improving this transition range is the connection of several thermocouples in parallel in different oven sections.

A flame failure detecting element is used in combination with a safety shut-off valve on ovens equipped with either oil- or gas-fired unit heaters. Such a safeguard assures protection of both oven and personnel against explosions in event ignition fails when the fuel is turned on.

1 **TORN** from its shell, the fish is machine trimmed and passed along.

2 **HAND** trimming removes what machine missed in readying for slicer.

3 **ROUNDED** off in slicing, steaks now weigh about a quarter pound.

4 **POUNDED** into thin, flat form by heavy wooden mallets, the abalone steaks are here made ready for final operations of weighing and packaging.

5 **PACKAGED** in three sizes—Large, large No. 2's, and small white—the steaks are distributed in 5-lb. lots. Owner Pierce is on the job here.

Abalone Steaks—Trimmed, Sliced, Packaged

MERLE SEVERN
Sequim, Wash

Abalone steaks are back on the market as a result of the operation of United Seafoods, Inc., packing company at Santa Barbara, Calif.

This shellfish is brought up from 50 ft. depths by divers in the waters off the Channel Islands. Carried to the packing house in special boats, the powerfully muscled univalves are put through the processing stages pictured on this page. The routine of tearing the fish from its shell, though not shown here, also belongs to the actual processing operation.

Cost is High

Because of the difficulties in gathering these mollusks, Abalone steaks are still in the specialty class, retailing at around $1.10 per pound. It costs around $4,000 to equip each diver, according to A. R. Pierce, owner and operator of the United plant.

The boxed product must be kept at low temperatures during shipment and storage, further adding to the cost. But Mr. Pierce hopes that widening channels of frozen food distribution will enable him to increase his markets while possibly reducing the costs of delivery.

The pictures above show what is done with the meat. Disposition of the shells is another story—and, in fact, another industry. Pins, bracelets, ash trays, and various other dodads are made from the shells by ornament makers in the area. Thus, not even a squeal is left of the abalone.

Cellophane-packed applesauce helps prove that—

Spices Stand Up in Freezer Storage

Seasoning strength of cinnamon, nutmeg and sage is unaffected after one year at low temperatures

WILBUR L. duBOIS

Head, General Products Branch, Quartermaster Food & Container Institute for the Armed Forces, Chicago.

Note: Special research undertaken in cooperation with the Quartermaster Food & Container Institute for the Armed Forces is reported in this paper, which has been designated No. 225 in the series approved for publication. The views and conclusions contained in this report are those of the author. They are not to be construed as necessarily reflecting the views or implying endorsement of the Department of the Army.—The Editors.

Freezing had little or no effect on the seasoning strength of cinnamon, nutmeg and sage in tests made by the Quartermaster Food & Container Institute for the Armed Forces.

In setting up a project to investigate low temperature effects on spices commonly used in foods, the Institute selected these three for its first study. And to begin with, it was decided that the best way to make the tests was to incorporate the spices in foods in which they are commonly used, since other components of the food might influence the result.

Consequently, cinnamon and nutmeg were added to applesauce and sage was used to season pork sausage.

The applesauce was made from apple nuggets, one portion flavored with cinnamon, another with nutmeg. Four levels of spicing were used, extending a little above and a little below the most acceptable degree of flavoring found in preliminary comparisons. The applesauce was frozen at —20 deg. F., then put in paper cartons with an inner lining of cellophane and stored for twelve months at 0 deg. F.

At the end of each month during this period, samples were removed from storage and allowed to stand overnight at 40 deg. F., and then at 70 deg. F. for six hours before serving. These samples were then compared for flavor with fresh applesauce made from the stock of apple nuggets and spiced at the same levels as the frozen samples.

Throughout the period of twelve months, reports from a taste panel indicated no change in the strength of cinnamon or nutmeg in applesauce.

In a parallel study of the effect of cold storage on the flavoring strength of sage in pork sausage, three types of the spice were used—purified, sterilized ground spice; emulsified spice; and soluble spice. All were made by the same company and presumably from the same basic material. They were all of equal quality, the differences consisting largely in convenience of use. All were scientifically blended and laboratory tested to make flavor control certain.

Sausage Yields Similar Results

In our study of sage in sausage we proceeded in much the same way as with spices in applesauce. Fresh pork shoulder was ground into sausage meat and divided into two portions. One portion was frozen at —20 deg. F. without any additions and stored at 0 deg. F. From the other portion samples were made containing sage at the flavoring levels found most acceptable by panel test. These samples were then frozen and stored as previously described.

At the end of each month, up to seven months, both spiced and unspiced samples were transferred from the 0 deg. F. room to the 40 deg. F. room and allowed to thaw overnight. The following day, seasonings (salt, pepper, and sugar) were added to the spiced samples, and the same seasonings plus sage were added to the unspiced samples. All samples were stored for 24 hr. at 40 deg. F. before serving.

Throughout the storage period of seven months, reports from the taste panel indicated no change in the flavoring strength of any of the three types of sage.

In this report, two types of food have been covered, one which is thawed and eaten without subsequent heating, and the other stored raw and cooked before serving. Another important group of frozen foods is that which is cooked before freezing and heated again before serving. In these foods the spices are heated twice. Since their pungency is due largely to volatile substances, this double heating may reduce the spiciness of the food.

Further extensive studies on these complex aspects of the subject will have to be made before accurate data can be offered.

We Think . . .

▪ Refrigeration Affords Food Processor Unutilized Opportunities

Over the years, refrigeration has practically revolutionized the food industry—from farming, through processing, to distribution—even consumption. Most processors are well aware of what has been done. But many are not so appreciative of the additional possibilities. At present, lower temperatures are generally considered useful only where perishables are involved.

One of the more recent applications of refrigeration to perishables is in the use of cold rooms for storing raw materials awaiting processing. This practice offers the advantage of avoiding fluctuations in plant operations due to variation in the rate at which raw materials are received. It also avoids quality deterioration or spoilage when the inflow of raw material gets ahead of the production line. More processors should investigate the advantages.

But most so-called "nonperishable" foods undergo slow quality depreciation. Peanuts, for example, require neither canning nor freezing after harvesting. Yet recent research has demonstrated that original flavor and color can be preserved in storage only by refrigeration. And even the quality of canned foods is better protected by cool storage. More interest should be taken, by all types of processors, in the benefit of a refrigerated environment for their products.

Effective use of refrigeration for nonperishables need not stop at warehousing. Proper instructions on the label or package can extend it into the consumer's home. This may sound like heresy to processors who have put much money and technology into compounding their product so that it will keep on the pantry shelf. But the domestic refrigerator is a good guardian of flavor and freshness for foods ranging from bread to coffee. Even shelled popcorn is more poppable if the unused portion of an opened can is kept in the refrigerator.

Certainly no processor or packer of nonperishables wants to tell the homemaker that the products *must* be kept cold. That might harm sales. But the label might state that a product of that type retains freshness longer if kept cold. Or at least the word could be spread through home economists who write for newspapers and women's magazines.

▪ Court Action on Food Standards Is Unpredictable and Costly

Court review of certain Federal food standards has been initiated in the past by companies who have felt that they were caused unwarranted difficulty by the standards. Different courts have handled these cases differently. This has caused a great deal of confusion in the minds of many in the industry.

Even the ablest food attorneys cannot accurately forecast what will happen when a standard of identity or other F&DA standard is taken into a Federal court. But there is no doubt as to the general underlying principles which should prevail and govern the court action. The court is not expected to review the judgment of the Administrator. His executive authority is presumed to be properly exercised and wisely applied with the aid of competent technical advisors.

The court will listen to an appeal from the judgment of the Administrator, however, if it appears that executive authority has been exercised improperly or capriciously. And if a decision or interpretation can be shown as not properly supported by the preponderance of evidence, the court will, of course, arrange for redress. In some cases, the courts give aid to apellants by ordering modification. More often they merely return improperly handled cases to F&DA and order a further hearing or review as to the facts.

Any case in the Federal courts represents costly and time-consuming proceedings. So any reasonable effort to make a court case unnecessary is usually an effort in the interest of economy. Perhaps the most important means by which court action may be made needless is to insure that a full and accurate record of all pertinent technical evidence is put into the record at the time of the standards hearings.

A number of very important standards cases are coming up in the future. The industries affected cannot afford to have careless or inadequate handling of their testimony at the hearings. It is much cheaper and much better to make the record right in the first place than to be forced into a court appeal later. Court action should be a last resort only.

▪ Unusual Canning Process Means Jobs for Technologists

A new market for young food technologists appears to be in the offing as a result of the announcement of the Cremogevac process for canning sweet corn (page 84). Developed by Dr. C. O. Ball, the pioneer in heat penetration studies, the new process is a common-sense, yet daring, innovation in the art of heat sterilization.

In brief, Dr. Ball keeps the cream component separate from the kernels and the brine in a can. Of course, few persons would have guessed that a layer of thick corn cream would remain unmixed during a retort cook, especially with the cream atop the kernels and brine. But they do remain separate. And the cream layer, which occupies only about one-fourth of the height of the container, can be sterilized by conducted heat in a relatively short time. The path of heat transfer is short compared to that in a can filled with fully mixed cream style corn. The other three-fourths of the can is occupied by whole kernels and brine, and this is sterilized by heat which is transferred rapidly by convection.

After the process is complete, the can of sterile product is mechanically shaken to distribute its contents uniformly. After that, it resembles cream style canned corn, except that its contents have escaped the excessive over-cook at the periphery—which must occur when heat penetration is solely by conduction through the entire mass. Consequently, the corn has no over-cooked flavors, as is the case with premixed cream style corn.

Just how "cranky" the new process is remains to be seen after these successful laboratory tests are put into plant-scale operations. Yet it appears to be almost certain that the new process must be operated under the supervision of a well-trained food technologist—at least until a foolproof routine can be established. And the United Products Co., owner of the process, is unlikely to allow it to be used unless there exists an adequate control set-up. Which, in time, means more jobs for young food technologists.

▪ He Is a Wise Processor Who Does Something About Pollution

Federal agencies have not gone very far yet in applying the new law which gives them greater authority to control stream pollution by industrial effluents. But smart industrial executives are not waiting for orders from the government. They are meeting in serious groups to figure out just how they may escape punitive or corrective orders by doing the job right from now on.

Several groups of food processors are likely to be importantly so engaged, if smart leadership is followed. State action appears so imminent in a number of areas that immediate control of sewage disposal becomes one of the most imperative jobs of technical men in the food business.

It undoubtedly will be much easier to deal with both local and Federal officials if they find corrective measures well under way when they make their first inspections. Under such circumstances, cooperative suggestions—rather than critical conclusions—may be expected.

▪ Cost of Equipment Is Not the Only Expense in Homogenizing

Sounds sort of silly, this hullabaloo in certain eastern cities about the price of homogenized milk compared to that of approved milk. Only a few years ago, one state milk control board ruled that no dairy might sell homogenized milk at less than a 1-cent differential above unhomogenized milk. Today, the authorities demand that homogenized sell at the same price as unhomogenized. It seems that the authorities calculate that a $5,500 homogenizer will pay for itself in 8½ days when its output is sold for an advance of 1 cent a quart over the input. After that the machine is supposed to operate for free, according to "impartial" reasoning.

One wonders if the gentleman who makes such flat statements ever paid for the electricity used by a 20-hp. motor and the labor required for cleaning a homogenizer daily.

▪ Direct Action More Effective Than Courts in Handling Growers

Food processors seldom win a suit to enforce a contract with the grower. So it was not surprising that a large eastern soup manufacturer recently failed to gain a decision against carrot farmers. The court's reason: The contract was unilateral. Which means that it was the customary type of processor-grower agreement.

Sometimes processors have found direct methods helpful in enforcing grower contracts. A canner in a small Indiana town discovered that growers were hauling their best tomatoes to a nearby city to get a higher price. So this canner immediately sent 15 truckloads there and broke the market.

A Michigan canner had trouble with his cabbage growers, who found a better price on the open market. Arguing that his plant did well by them year in and year out, the canner made a deal whereby he took the cabbage, sold it in the open market, and split the extra "take" fifty-fifty. The next year all the local farmers grew cabbage, and the canner had no price problem.

There are more ways than one to save your shirt!

▪ Tsetse Fly Control May Greatly Boost World Beef Supply

Now that Imperial Chemical Industries has developed antryeide—said to be a cure for trypanosomiasis or sleeping sickness—we are told that the tsetse fly region of Africa will become the world's greatest cattle producing area. That territory is computed to be larger than the U.S.A. and Mexico. Africa, it seems is a big continent.

Suppose that tsetse fly control becomes a reality and that cattle production reaches the predicted heights. Then it does not tax the imagination to foresee profound repercussions on the food economy of the world when low-cost range-fed beef from 4½ million square miles of land enters the channels of trade. While it may cause ultimate economic unhappiness in other beef-exporting nations, it will do much to restore the United Kingdom to better days. And it may postpone the evil days when the population of the world will outstrip its food supply.

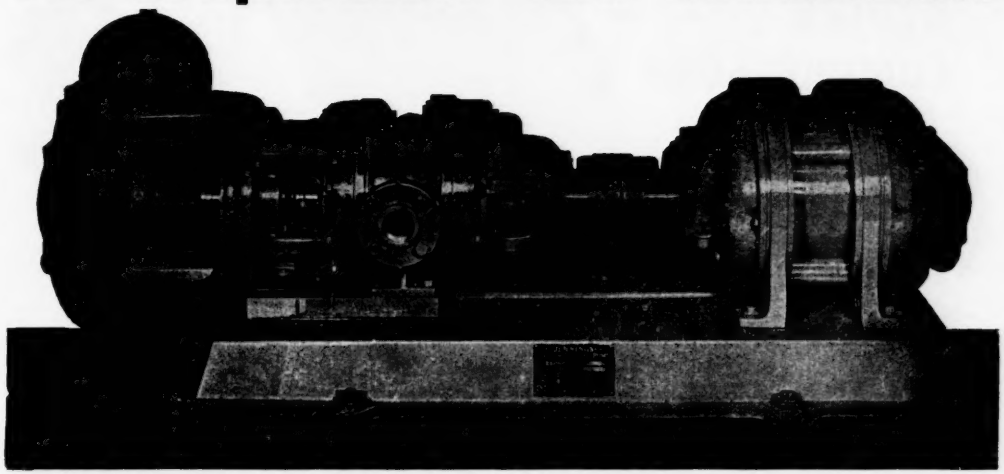
▪ Reductio Ad Absurdum—You Could Call It Prepackaged Milk

"Meat Prepackaging Growing," says a metropolitan newspaper, and immediately one wonders when packaging became prepackaging. The good old American custom of adding superfluous adjectives or prefixes was never more manifest than in "prepackaging."

Packaged meats are packaged whether the packaging is done at the packing house or the retail outlet. And if one desires to pursue the argument to absurdity, why not prepackaged bread, prepackaged milk, prepackaged candy or prepackaged heat-sterilized foods?

Advertising managers who seek novelty phrases in describing processed foods seem to have overlooked a bet: Borden's prepackaged homogenized milk, Campbell's prepackaged soups, Heinz's prepackaged catchup, Libby's prepackaged pickles, National Biscuit's prepackaged crackers. Hot damn! Something new can be added!

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

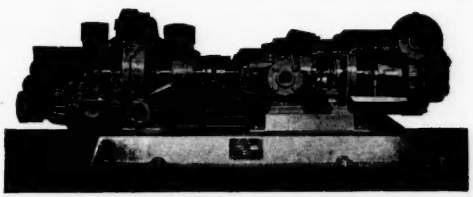


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.



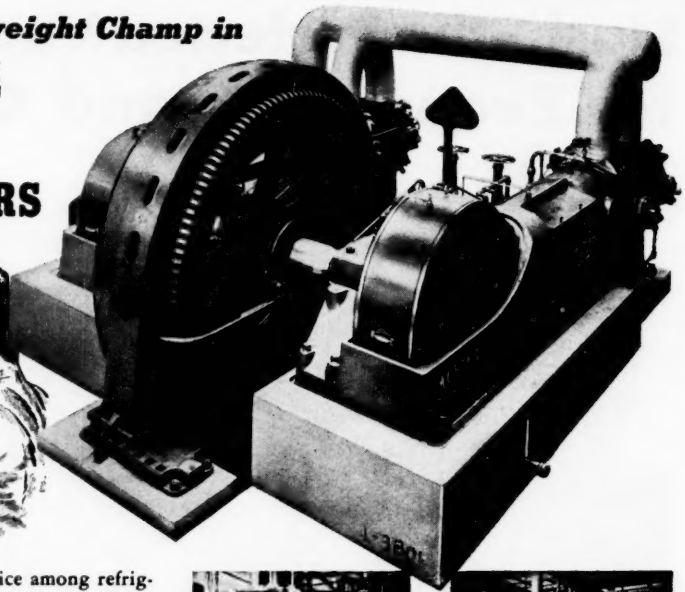
THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

Here's the Heavyweight Champ in

HORIZONTAL DUPLEX COMPRESSORS



For heavy-duty work, first choice among refrigeration compressors is the Worthington Horizontal Double-Acting Compressor.

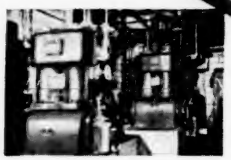
There's *solid punch* in the machinery-steel piston rods operating in special alloyed semi-steel cylinders with full-size suction and discharge openings, large refrigerant-gas passages and liberal valve area.

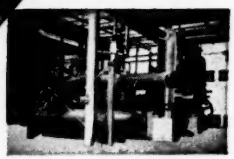
There's *sure-footedness* in the cast-iron frame, with base extending full length to minimize cylinder overhang and give maximum bearing on foundation.

There's *staying-power* in the open-hearth steel-forged crankshaft . . . counterbalanced crank pressed onto shaft and securely keyed . . . heat treated and hardened crank pins . . . marine-type connecting rods.

And there's *trouble-protection* in the exceptionally deep stuffing boxes with metallic full-floating packing . . . babbitt-lined steel bearings centrifugally cast in steel . . . full pressure-type lubrication on large sizes, flood type on smaller.

For further proof that *there's more worth in Worthington,* see your nearby Worthington distributor, or write for Bulletin C-1100-B20 to Worthington Pump and Machinery Corporation, Harrison, N. J. *Specialists in air conditioning and refrigeration machinery for more than 50 years.*





WORTHINGTON IN WORLD'S LARGEST ORANGE JUICE PROCESSING AND CONCENTRATING PLANT

At the Dunedin, Fla. plant of Juice Industries—reputedly the largest of its type in the world—Worthington has installed:

LEFT—Three vertical ammonia compressors to cool two large storage rooms—one where frozen concentrated orange juice is kept at zero degrees, the other for standard concentrated juice at 35F. Both rooms are 80 by 80 by 20 ft high; the former has 12 in. of insulation, the latter 6 in.

RIGHT—Horizontal ammonia compressor for quick-freezing the concentrated juice at minus 20F. Quick-freezing of the juice (while packed in cans) seals in the vitamin content which would dissipate if stored for long at moderate temperatures.

WORTHINGTON

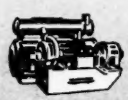
A9-37

FIVE MORE REASONS WHY WORTHINGTON LEADS IN INDUSTRIAL REFRIGERATION

Horizontal compressors for all types of refrigerants

Shell and tube refrigerating equipment

Centrifugal compressors



Absorption refrigerating machines

Chilling machines and exchangers

Convention Reports

Reduction of Food Plant Operating Costs Keynotes Materials Handling Show

Problems and improved methods discussed at conference. Latest developments in equipment exhibited

Unnecessary and inefficient materials handling can mean the difference between operating at a profit or at a loss in the period which lies ahead.

This observation, backed up by estimates that 30 to 50 percent of manufacturing expenses go for materials handling, was the keynote of the highly successful Third Annual Materials Handling Show and the concurrent conference at Philadelphia in January.

At the conferences, the how's, why's, and problems of more efficient handling methods were discussed by engineers and executives from many industries. Displayed at the show—which included 225 exhibits occupying 100,000 sq. ft.—were the latest developments in materials handling devices.

Of particular interest to food processors was a discussion of the problems encountered in the shipping by rail of palletized loads. Shippers are asking the various carriers for reduced rates on palletized loads, to make shipping on pallets economically feasible. According to J. W. Milliken, associate editor, *Railway Age*, reduced rates would represent a saving for the shipper at the expense of the carrier. An estimate of what this would mean to the carriers was given.

It was assumed that approximately 8,250,000 cars of freight could have been palletized in 1946. Therefore, for that one year, if the railroads had allowed a tonnage of 1,000 lb. per car, they would have hauled 4,125,000 tons of freight with no direct reimbursement. To solve this problem, a joint shipper-carrier study is needed.

What is a materials handling engineer? That question, which has had puzzling aspects for food company executives, was discussed by T. L. Carter, American Cyanamid, Co., who listed the qualifications of such a man:

Topping the list is plenty of varied experience in engineering. Not only must the man be qualified by education, but by practical experience. And the more varied his practical experience, the more valuable will he be in his job. If he has carried responsibilities in maintenance, he will know the importance of maintenance in his planning.

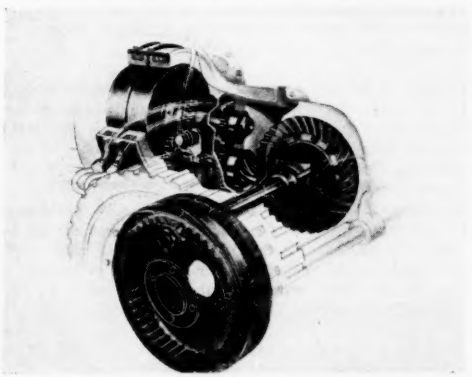
He should have some actual building design and construction experience, so he will realize what cutting holes and increasing floor loads means. He should have had experience with various types of materials handling equipment, and he ought to know plant production operations. He must have a knowledge of traffic, safety, time study and methods, and—today—labor relations.

Mechanized handling has revolutionized the fundamental principles of industrial safety, according to P. M. Rush, General Aniline Film Corp. Development of the fork-lift truck and pallet system meant moving of greater mass at greater speed. The comparatively minor risks involved in lifting and transporting materials were replaced by major hazards to personnel—ranging from dangers in stocking or tiering material 18 ft. high to stepping in front of a fast-moving 5-ton fork truck.

Safety is of primary importance in each of the following phases of materials handling: (1) Preliminary handling, (2) selection of equipment, (3) preparation of areas in which equipment will operate, (4) formation and dissemination of safety rules and regulations, (5) training of personnel, and (6) continual review of operations.

Highly significant data on savings effected by an automatic pallet loader were given by F. H. Landon, Sun Oil Co., Philadelphia. Allowing for all benefits, the cost of labor for manual handling was put at 3c. per man-minute. The operation was done manually at the rate of 0.125 man-hours per ton, or the equivalent of 8 tons per man-hour. Even with this efficient manual operation, the automatic machine would show savings of $17,500 per

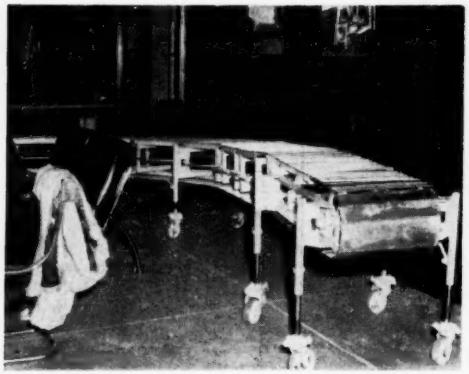
Camera Catches New Power Transmission and Tier-Unit Display



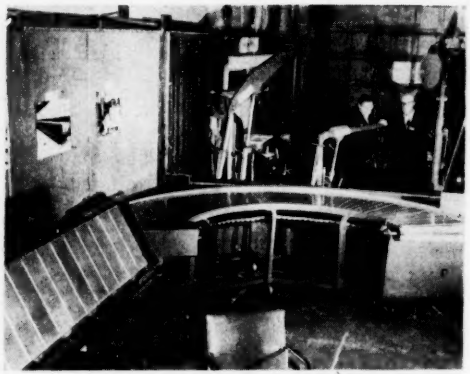
POWER transmission via magnetic induction is a new development in Clark fork-lift trucks. It eliminates the clutch, permits instantaneous reversal of travel direction, cuts wheel slippage, and increases working speed. Finger switch lever on steering column controls travel direction.

MODEL of multi-tier continuous tray conveyor for process operations which require "waiting time." Saving floor space, this Greer unit is conveniently loaded and unloaded at adjacent stations. Work is being done to adapt the machine to various continuous food processes.

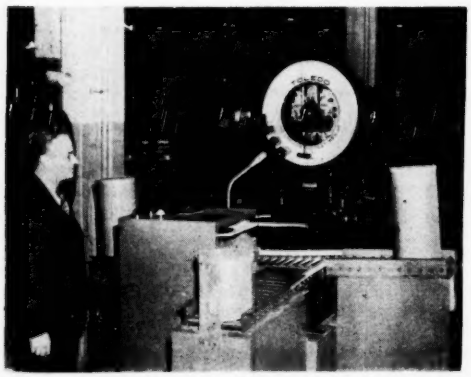
Late Model Conveyors and Scales Were Also Shown



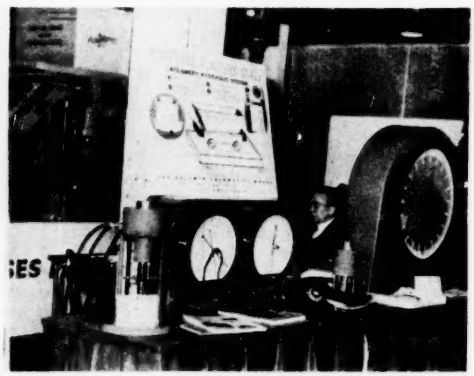
CURVES are easily negotiated by this flexible Creager conveyor, because the metal slats are individually attached to the driving chain at the center to permit pivoting. The slats are not fastened to each other, but they overlap.



POWER-DRIVEN Sermat metal slat conveyors. Curved one has been installed as spiral bread cooler. Inclined one with uprights on bottom chain (left) has been used to carry bags of potatoes past inspection and check-weighing stations.



PHOTOELECTRIC cells on the dial of this Toledo scale actuate rotating arms which push under- or over-weight containers from the main conveyor onto a reject conveyor. Two pairs of electric eyes provide two sets of weight tolerances to accommodate packages of two sizes.



NEW in weighing devices is platform scale riding on hydraulic cells which actuate Bourdon tube. Latter moves air valve to operate servomotor driving scale pointer. The maker, Baldwin Locomotive Works, also has adapted electric strain gages for weighing liquids in tanks

year and would justify an investment of $30,000.

It is not unusual to justify an investment of $10,000, $20,000 or even $25,000 in equipment which will replace one man on the payroll, according to Stevens H. Hammond, president, The Whiting Corp. In addition to direct savings, other benefits can be obtained from efficient materials handling. One is the steady flow of materials through the plant as a result of effective handling

Efficient handling of materials in refrigerated warehouses was the subject of a talk by D. O. Haynes, Merchants Refrigerating Co., New York City. He described a method for handling materials in refrigerated cars. Standardized 36x48-in pallets were used. Most refrigerated car doors are 48 in. wide, but gaskets on the jambs cut down the clear space considerably. Obviously, a pallet measuring 48-in. on the fork entry side cannot pass through this opening. Means were devised for bringing it out the 36-in. way.

The method involves the use of a special pallet dolly and two lengths of narrow roller conveyor laid parallel from the door of the car to the platform. The bottom of the dolly has two sets of long rollers and the top two sets of short rollers set at right angles to the bottom ones. When a pallet is placed on the dolly and a unit load assembled on the pallet, the dolly and load are pushed longitudinally in the car riding on the lower rollers of the dolly. When the load reaches the roller conveyors at the door, the loaded pallet is pushed off the dolly onto the conveyor line along which it rolls to a stop. Here a fork truck takes over.

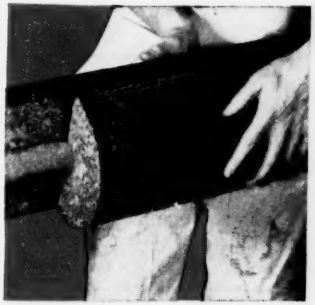
New and Improved Equipment

A solution to the pallet problem in carrier transportation was offered by Clark Equipment Co. It involves the use of cardboard sheets as pallets. A gripper pulls the sheet and its load onto the truck, and a pusher forces the load off. In this way, conventional pallets are eliminated and the shipping cost of deadweight removed.

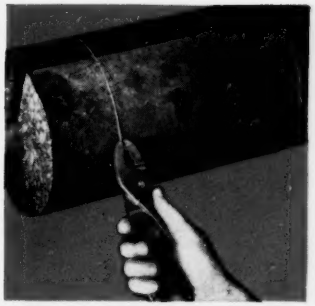
Among other lift truck attachments exhibited were arms for handling barrels and other loads by gripping at the side, a scoop which is interchangeable

(Turn to page 204)

1. The pipe has first been thoroughly cleaned. Here Armstrong's Waterproof Cement is being applied.



2. Sections of cork covering are tightly butted against each other. Longitudinal joints at top and bottom.



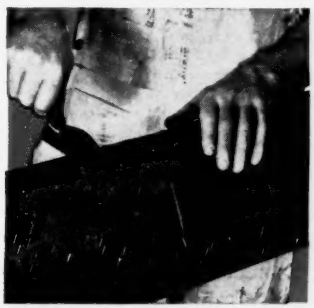
3. The covering must hug the line snugly. It is held in place with copper-clad steel wire, drawn tight.

How to get a good cold line insulation job

The combination of good material and workmen who know how to apply it properly is your best assurance of long and efficient performance from cold line insulation. Workmanship is extremely important, for poorly applied insulation means needless waste of expensive refrigeration. The slightest opening in any joint allows heat to flow in and moisture to condense in the break. If this moisture freezes it exerts a pressure that enlarges the opening and may damage the insulation itself.

Shown here are five of the important steps in doing a good cold line insulation job—a job that with proper maintenance will last for many years and keep cost of refrigeration down. The insulation being used is Armstrong's Cork Covering, a material whose low thermal conductivity and general all-around durability have made it the standard of comparison among cold line insulations. It is being applied by one of the skilled workmen of Armstrong's Contract Service.

For an estimate on the cost of insulating a low-temperature line the way it should be done or for full information on Armstrong's Cork Covering, call the Armstrong District Office nearest you or write direct to Armstrong Cork Company, Building Materials Div., 4203 Concord St., Lancaster, Pa.



4. All joints are carefully pointed up and sealed with Armstrong's Seam Filler to keep out vapor.

5. The completed job gets a good coat of Armstrong's Cork Covering Paint.

- **DON'T** apply insulation when the line is cold or wet.
- **DON'T** try to save money by using untrained workmen.

ARMSTRONG'S INDUSTRIAL INSULATION

Complete Contract Service
For All Temperatures

From 300° Below Zero

To 2800° Fahrenheit

Salad Dressing and Mayonnaise Manufacture

Modern Automatic Equipment Keeps Production Line Running Continuously

(Article on Page 69)

HIGH EFFICIENCY in the processing of dressing products is exemplified in the new, continuous production line operated at the Durkee Famous Foods plant in Norwalk, Ohio. Moreover, it is notable that this plant has been specifically engineered to permit doubling of production in the future with addition of only a small amount of equipment.

The new processing line is detailed in the fold-out flow diagram (right), and it is illustrated by accompanying photos that are numbered to key with indicated points on the drawing.

Flexibility is an outstanding feature of this new Durkee dressing line. It now does triple-duty—makes salad dressing, mayonnaise, and sandwich spread. Quadruple-duty is feasible, since the line can also be used to make French dressing.

The entire line is employed in the making of salad dressing. Operations key-numbered (2) to (4) in the diagram show the steps in making starch paste or the starch-vinegar mix. Production of salad dressing is completed in operations key-numbered (5) and (6).

Manufacture of the other dressing products—mayonnaise and sandwich spread—is initiated at (5) in the diagram. And from this point on to the end of the line—to (11) in the diagram—all three types of dressing products are handled through the same processing units.

Referring to the start of the diagram, the liquid ingredients—blended vegetable oils and vinegar—are delivered to the plant in tank cars (wooden ones for vinegar). The oil is pumped into black iron storage tanks, the vinegar into wooden tanks.

The solid ingredients—salt, sugar, starch, and stabilizer—arrive via boxcars in 100-lb. bags. These bags are loaded onto pallets and hauled to the raw material storage area by fork-lift truck. Frozen eggs, in 30-lb. tins, are delivered by refrigerated cars. They are loaded on pallets and held in a cold storage room.

In making salad dressing today, the starch paste portion of the product is prepared continuously, rather than by the former batch methods. Water and vinegar are weighed into a 200-gal. tank, where they are mixed with starch, stabilizer, salt, and sugar. This starch-slurry mix is then pumped into a 300-gal. holding tank, where it is constantly agitated. Sufficient amount of slurry is held in this tank so that it can be continuously fed through the starch paste cooker and cooler.

From the holding tank, the slurry is delivered by a duplex piston pump through four Votator processing units in series, at the rate of 1,500 to 2,500 lb. an hour. These units provide: (1) Vigorous agitation, (2) rapid cooking and cooling (in a matter of seconds), and (3) precise control of temperature and viscosity. Thus, a uniform paste is assured.

The paste next flows into two 500-gal. gelling tanks, where it is further gelatinized and held ready for the premixers. Paste and cooled oil (which go to make salad dressing) are metered into one of two premixers—at (5) in diagram—then blended by turbine-type impellers with eggs and combination spice oils. By alternating mixing operations in the two mixers, the process is kept continuous.

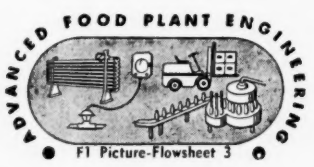
It is in the premixers (5) that preparation of mayonnaise and sandwich spread begins. The paste is omitted in the manufacture of mayonnaise, but vegetable relish is added to the mayonnaise base in the preparation of sandwich spread.

From the premixers, the dressings are pumped by a lobe-type positive displacement pump through the emulsifier. Here the emulsifier—also called the colloid whipping mill—completes the ultra-fine mixing of the dressings so that they are further stabilized to produce smooth-textured products that will not separate.

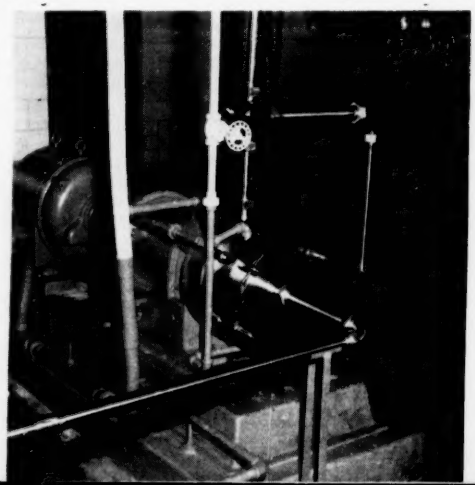
Finally, the dressings are delivered to the packaging line, where they are automatically filled into jars, capped, labeled, and packed into shipping cases that are automatically glued and sealed. Cases are then loaded on pallets and moved to the finished-stock storage area by fork-lift truck.

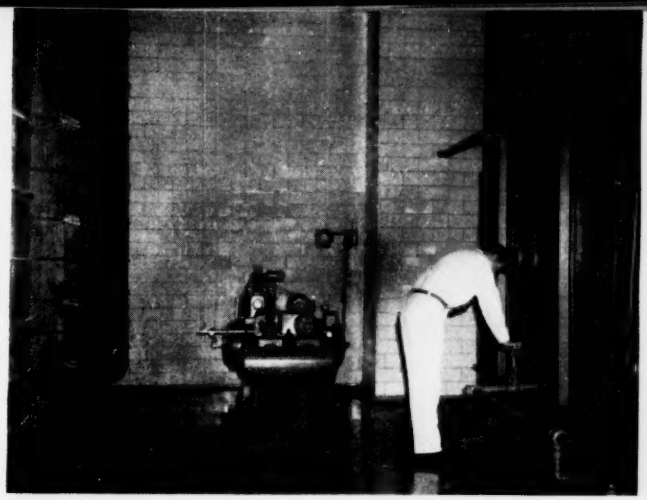
Present capacity can be doubled by installing additional Votator processing equipment and another emulsifier (colloid mill). It will not be necessary to add extra tanks for starch-slurry mixing, slurry holding, gelling, and premixing.

FOOD INDUSTRIES *March 1949* PAGES 124-127



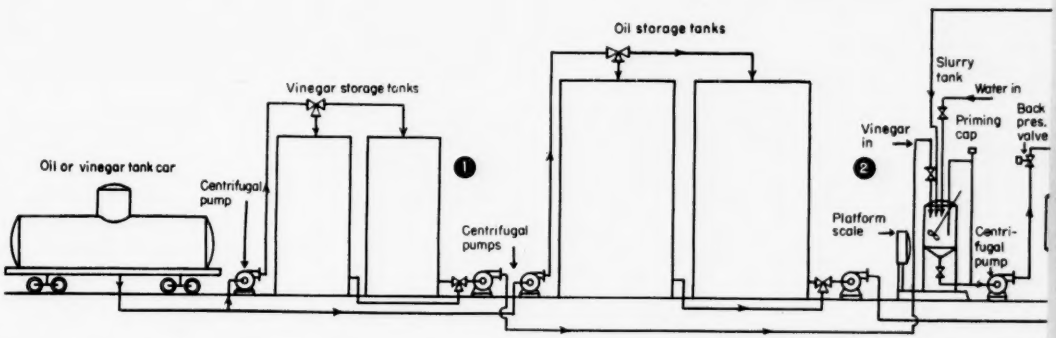
6 DRESSING PRODUCTS are discharged from emulsifier (foreground) and go to start of packaging line (rear).





1 LARGE TANKS for oil (right) and vinegar (left) permit deliveries of tank car amounts. Oil is metered into premixers. Vinegar is weighed into tanks.

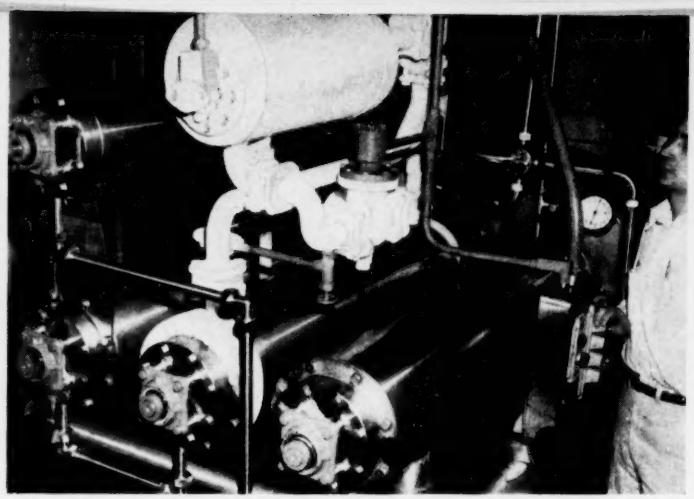
2 PREPARATION of starch-slurry—a mix sugar, and stabilizer—initiates the maki



7 FILLING jars—six at a time—with dressing products. Bottle cleaner removes dust likely to have accumulated in empty jars after delivery.

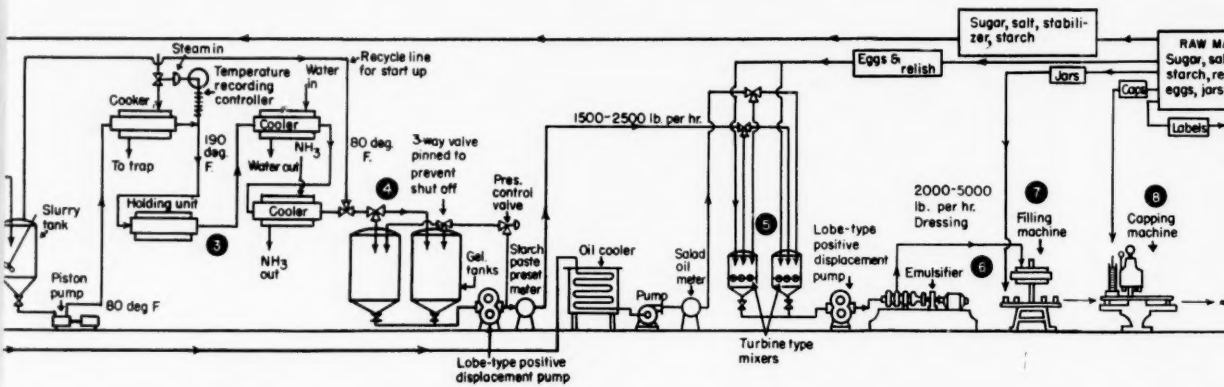
8 SLAT-TYPE CONVEYOR carries jars filling machine to high-speed automati

ure of starch, salt, vinegar, ıg of salad dressing.



3 **SLURRY** is continuously cooked to a starch paste in this Votator processing equipment. Unit also rapidly cools paste, and thus stops the cooking action.

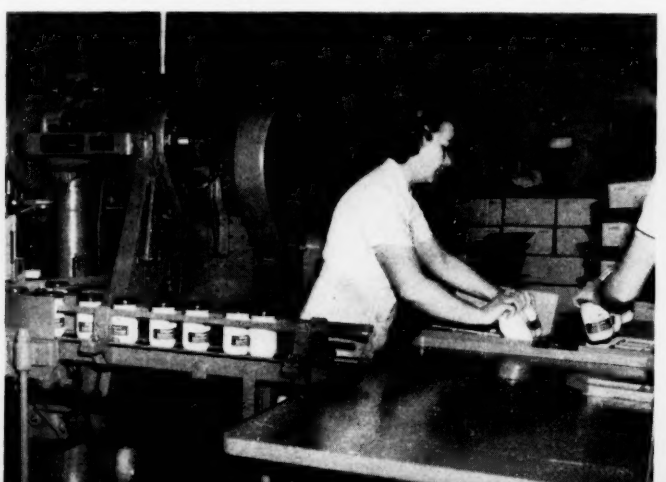
4 **TO GEL TANKS** (above) units. In tanks, it is allow

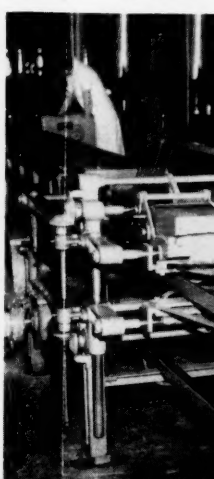


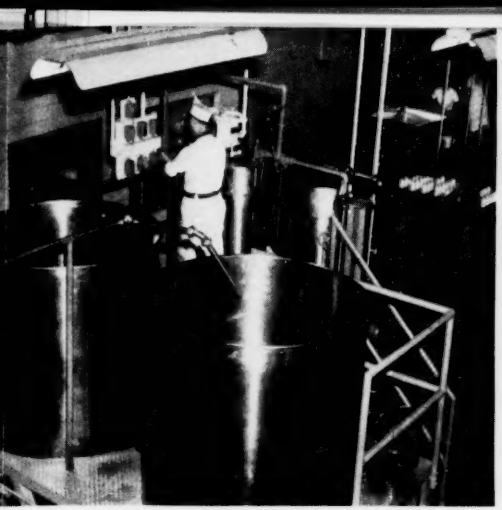
of dressing products from volumetric jar-capping machine (left).

9 **LABELING MACHINE** (left) automatically applies coded labels to jars, which are then packed into shipping cases coming from nearby unscrambler.

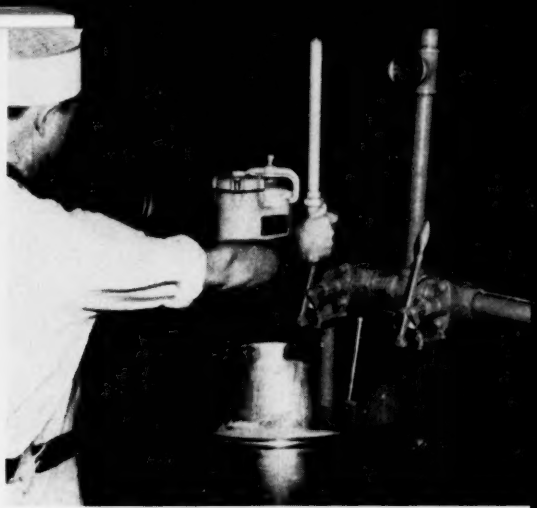
10 **CASES** are glued and end of compression



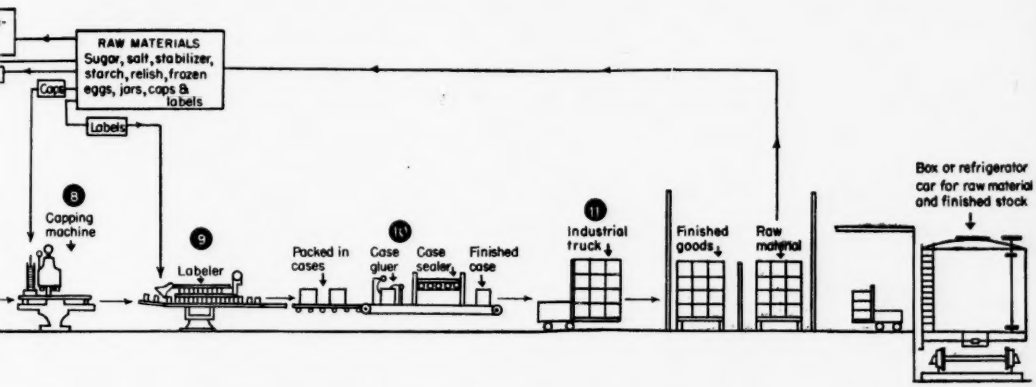




. TANKS (above) comes starch paste from cooking and cooling n tanks, it is allowed sufficient time to reach maximum "set".

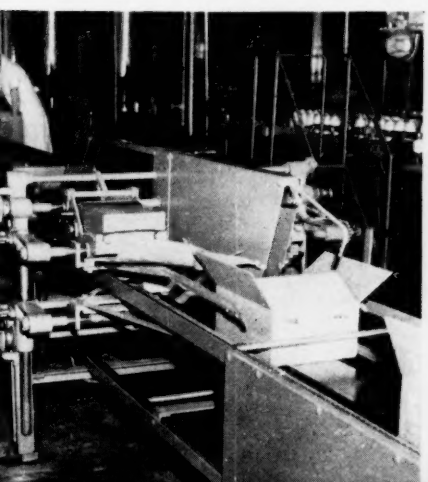


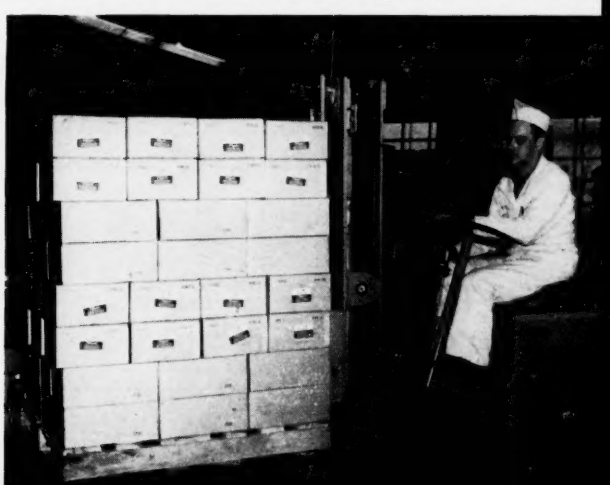
5 AT MIXERS, oil paste, and eggs are blended to make salad dressing. Mayonnaise and sandwich spread are made.



ES are glued and sealed on automatic equipment. At of compression belt, cases are loaded on pallets.

11 PALLET LOAD, containing 96 cases, is transported by fork-lift truck to the finished stock-storage area, then shipped by truck or box car.



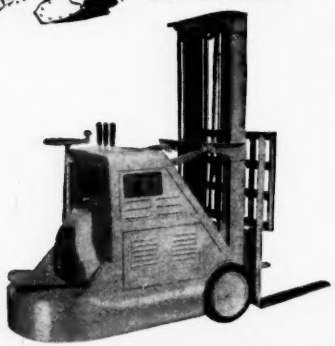


LOWER your "Break Even" point with MOBILIFT!

With today's leveling-off process, profit margins may be smaller. To lower your "break-even" point may be your prime concern. Then every cost will have to be studied — every economy will have to be made.

In materials handling you will probably find your greatest wastes—and your greatest opportunities for savings. That is why so many plant executives have "Mobilized" their materials handling operations. Mobilift is designed not only for lower initial costs, but for lower per unit costs of handling materials. Its compact design, its adaptability to many types of handling and its speed of operation have lowered handling costs for thousands of American industries.

"Mobilize" now for a lower "break-even" point in your operation. Sign the coupon below and let us prove the economy of a Mobilift handling system in your plant.



MOBILIFT CORPORATION
835 S.E. Main St., Portland 14, Oregon

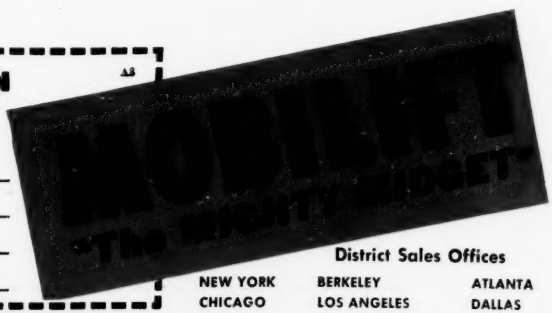
Please send me your illustrated folder on Mobilift operation.

Name_____

Firm_____

Address_____

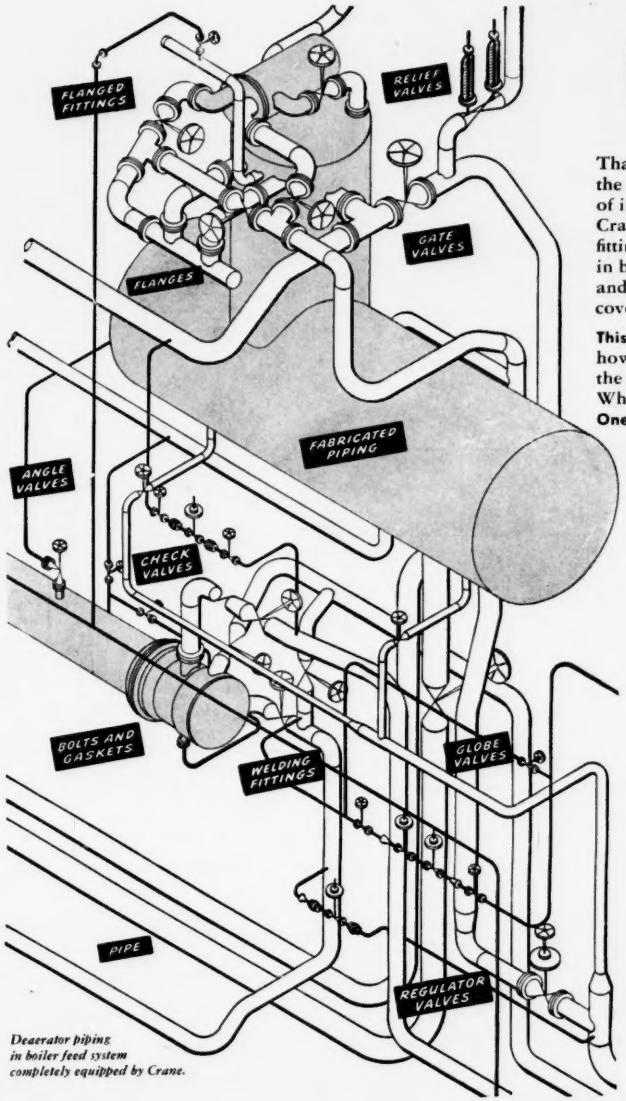
City_____ State_____



District Sales Offices

NEW YORK CHICAGO BERKELEY LOS ANGELES ATLANTA DALLAS

Everything in piping...for every need ...on one order to CRANE



Deaerator piping in boiler feed system completely equipped by Crane.

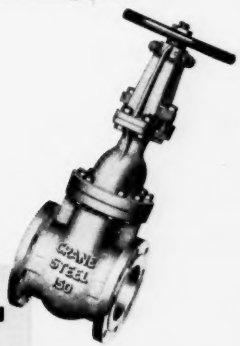
ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY

That's the kind of service you get from Crane, the world's leading manufacturer and supplier of industrial piping equipment. "Everything" at Crane includes an unequalled selection of valves, fittings, fabricated piping, pipe and accessories—in brass, iron, steel and alloys. One catalog . . . and one order to your nearest Crane Branch cover whatever is needed for the job.

This Deaerator Piping, for example, illustrates how completely Crane supplies everything for the system, regardless of the fluids to be handled. When you standardize on Crane, you depend on **One Source of Supply** broad enough to simplify every piping procedure. You get better installations . . . avoid needless delays . . . by placing **Undivided Responsibility** on Crane for materials. And for **Highest Quality** in every piping item, specify Crane Quality—unsurpassed for more than 90 years.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

FOR TOUGH STEAM SERVICES *up to 750 deg. F., and for water, oil, air, gas and other non-lubricating liquids up to 500 deg. F., Crane recommends No. 47XR 150-pound Cast Steel Wedge Gate Valves. Designed for tight seating with long-lasting Exelloy to Nickel Alloy. Screwed, flanged or welding ends. Sizes: 2 in. and larger. See your Crane Catalog, p. 304.*

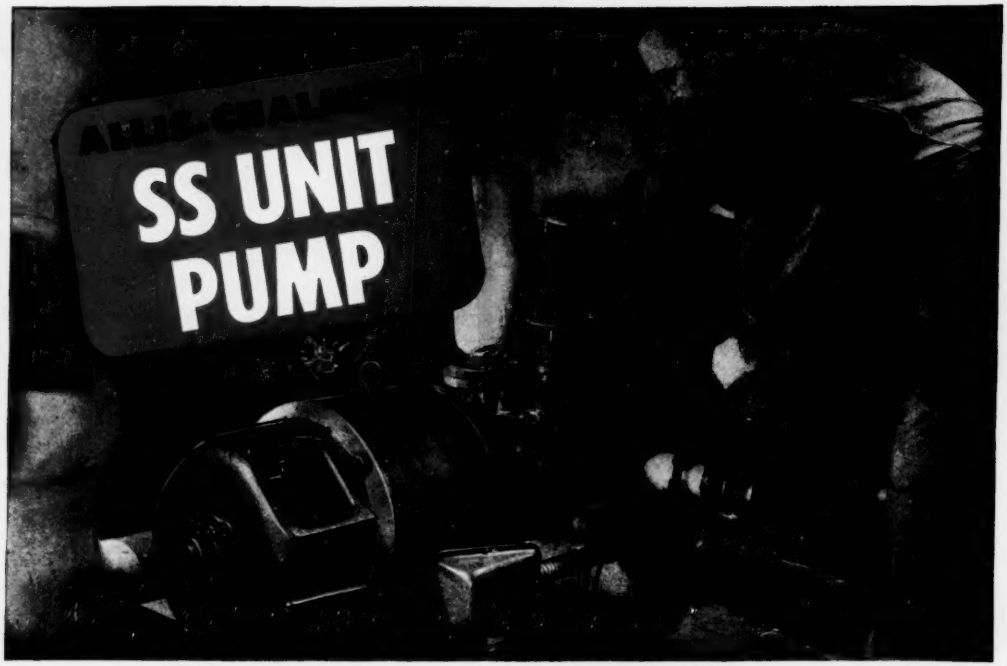


EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM



50% MORE LIQUID
33% LESS POWER

User Reports: *Previous* displacement pump required 15 hp motor for 100 gpm capacity at 110 ft head. *Now* Allis-Chalmers SS Unit Pump with only 10 hp motor delivers 150 gpm at same head!

IN ADDITION, this same user reports savings in space and maintenance.

Paper, Petroleum, Mining, Chemical — in *any* industry, Allis-Chalmers SS Unit Pumps can be used for circulating, gathering, water supply, drainage, etc.

Check these 4 features: —

Deliver Rated Efficiencies — Every unit tested at the factory and the performance curve plotted. Efficiency is proved.

Heavy Construction — Compare section thicknesses, shaft diameters and other features. See why SS Unit Pumps run years without repairs.

Easy Maintenance — Compact design and few parts reduce maintenance. Bronze ring protects casing from wear. Is easily replaced when required.

Application Engineering — When a pump is recommended by an A-C Pump Application Engineer, you know that you are getting the pump that fits your needs exactly and that will give you dependable service at low cost per gallon.

SS Unit is one of many Allis-Chalmers models for most industrial pumping services. For information, see your Allis-Chalmers Authorized Dealer or District Office. Or write for Bulletin 52B6059E. Also listed in Sweet's. A 2603

SS Unit, Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS, 1113A SO. 70 ST.
MILWAUKEE. WIS.

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and District Offices throughout the country.

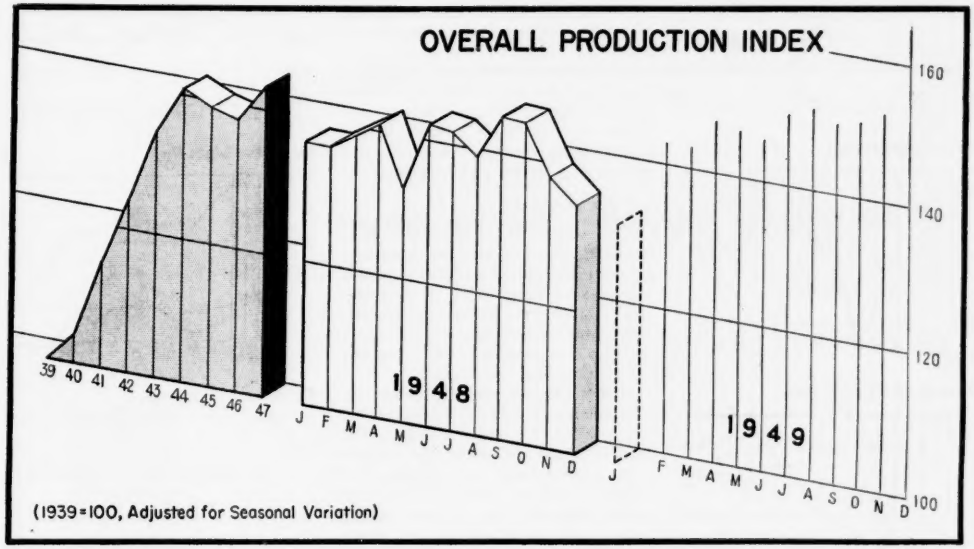
MOTORS — ½ to 25,000 HP and up. Matching Allis-Chalmers Control.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

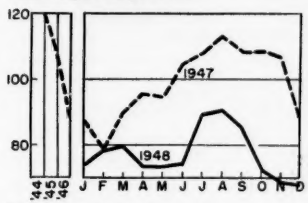
PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

ALLIS-CHALMERS

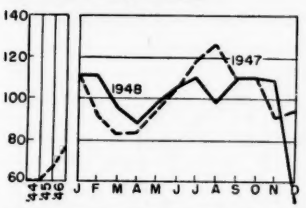
Food Industries Index


OVERALL PRODUCTION INDEX
160
140
120
100
39 40 41 42 43 44 45 46 47
1948
1949
J F M A M J J A S O N D
J F M A M J J A S O N D
(1939=100, Adjusted for Seasonal Variation)

Cane Sugar Stays Down



Beet Sugar Drops Sharply



At a Glance—

(1939 = 100. With All Figures Adjusted for Seasonal Variations)

	Dec. 1948	Month Ago	Percent Change	Year Ago
Baking	138	140	−1	133
Beverages	154	153	+1	146
Butter	64	65	−2	65
Canning	136	136	..	146
Cereals	135	141	−4	142
Condensed Milk	172	176	−2	170
Confectionery	128	147	−13	153
Flour	130	131	−1	135
Ice Cream	162	161	+1	177
Malt Liquors	149	153	−3	159
Margarine	250	237	+5	282
Meat Packing	143	143	..	150
Sugar, Beet	50	109	−54	96
Sugar, Cane	68	69	−1	89

Slight Drop in Overall Food Production Seen in Preliminary Estimate

Latest index reading (preliminary) and comparative previous-month figure (revised) are shown each month in the "spot" indicator on FOOD INDUSTRIES' *cover.*

Estimates of overall food production dropped two points to a level of 133 in January, according to preliminary figures. (The final figure for December was 135.) Meanwhile, prices of foods plummeted in wholesale markets, in company with declining spot prices for farm products.

Wholesale prices of farm products and foods are now lower than they were after the break of February, 1948. From August on, farm prices had declined 12 percent by February 1 of this year, compared with a 10 percent drop from January to February, 1948. Wholesale food prices dropped 17 percent in the same 1949 period, compared with the 1948 decline of 7 percent.

Beet sugar production plunged 55 index points on a seasonally adjusted basis last December. This was the result of an abnormally short sugar beet crop last year. Normally, operations in beet sugar reach a peak in November, with December somewhat less. In 1947, for example, production in tons of beet sugar fell only about 30 percent from November to December. However, last year the drop was over 80 percent for the same months.

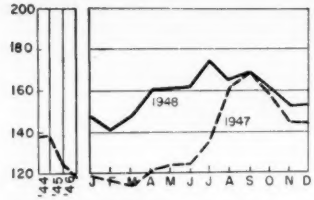
This is a more than seasonal decline in beet sugar output. In "normal" crop years, processing does not drop off sharply until January, and in good crop years, it may continue high until February.

Coverage of Index Groups

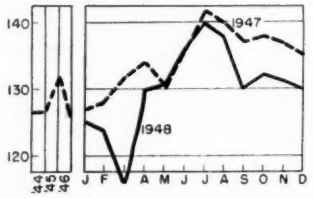
A number of letters have come in asking for clearer definition of the coverage of some of the individual groups in the FOOD INDUSTRIES Index. In response to the demand, the next few paragraphs are devoted to a clarification of the contents of the groups in the Index. The groups are those set up by the Bureau of the Budget in their Standard Industrial Classification Manual, used as a guide by the Bureau of Labor Statistics in grouping their employment and average weekly hours figures, the basic data from which the indexes are worked out.

Baking, the largest single group in the Index, amounting to almost 26 percent of food processing activity, covers the entire baking industry. It includes both so-called perishable baked goods, such as bread, cakes, pies and other pastries, and the "dry" prod-

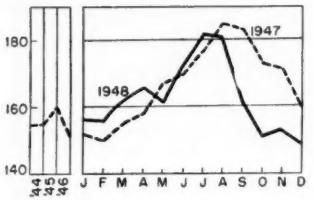
Beverages Turn Up



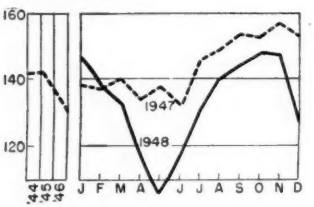
Flour Keeps Falling



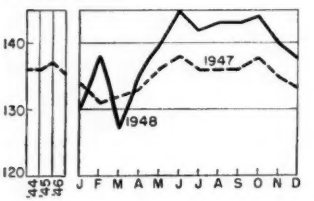
Malt Drinks Turn Again



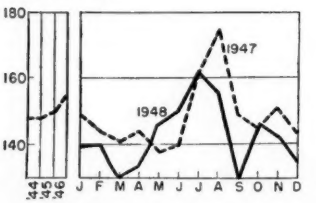
Confections Tumble



Baking Still High



Cereals Fall Off



uets, such as pretzels, crackers, etc.

The second largest component, Canning, which accounts for about a quarter of food processing activity, has almost equally wide industry coverage, including all canning and preserving of fruits and vegetables. The preparation of fruit and vegetable juices, soups, canned vegetables, and some frozen and dried foods are all covered in the Canning index. The only aspects of canning not covered in the Index are processing of sea foods and pickling of fruits and vegetables.

Includes Slaughtering

The other large component, Meat Packing, covers not only the processing of meat into canned or cured products, but also the slaughtering of meat animals. This gives better than 95 percent industry coverage, since the only activity not included is the processing of poultry and small game.

Dairy Products are represented in the indexes of Butter, Condensed and Evaporated Milk, and Ice Cream. The Butter index, one of the two components of the Index that is based on actual production rather than employment adjusted for average weekly hours (the other is margarine), covers the production of creamery butter. This excludes the output of butter on farms and ladle butter.

The index of Condensed and Evaporated Milk takes in the manufacture of condensed and evaporated milk and related products—condensed and evaporated buttermilk, dried and powdered milk, ice cream mix. The Ice Cream index covers businesses which make ice cream and other frozen desserts.

The Flour index includes companies that mill flour from grains except rice. The index covers not only all wheat flours, but rye, corn and buckwheat.

Cereals, another grain product, covers the manufacture of breakfast cereals such as oat meal and corn flakes.

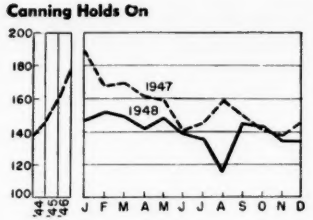
Drinks Well Covered

The index of Beverages includes the processing of soft drinks and carbonated water—but does not include the manufacture of vegetable and fruit juices, which are covered in the Canning index. Malt Liquors include businesses that manufacture beer, ale, stout and other like beverages.

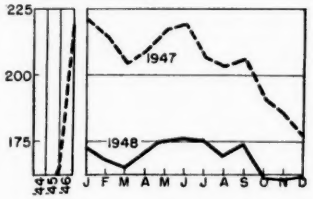
The sweet portion of food processing is covered by three indexes—Beet Sugar, Cane Sugar and Confectionery. The latter covers manufacture of all conceivable candy types, including lozenges and chewing gum.

Margarine, the smallest component of the total food index, and an index that is constructed from actual output figures, covers the manufacture of both colored and uncolored margarine.

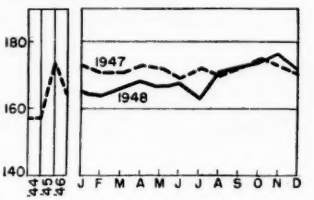
Canning Holds On



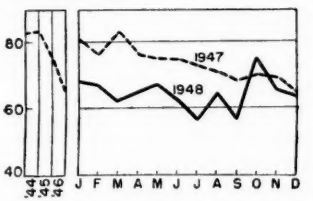
Ice Cream Edges Up



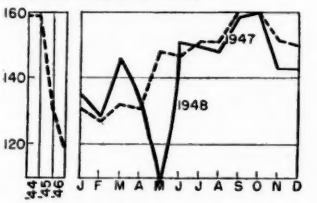
Condensed Milk Drops



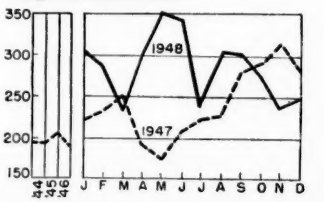
Butter Drops Again



Meat Packing Halts Drop



Margarine Makes Gain



Lift your foods to a flavor peak

with *Ac'cent*®

PURE MONO SODIUM GLUTAMATE

Ac'cent improves the flavors in most meat products, poultry, fish and vegetables in freezing or canning methods. Samples will be sent upon request along with more specific information outlining the suggested testing procedures. *Ac'cent* is available in 200 pound units for bulk purposes.

In fresh, frozen or canned foods, AC'CENT does a natural flavor-lifting job that can't be matched. It can be depended upon to balance, blend, and intensify the total flavor effect without imparting any flavor of its own. These unique characteristics have their place in all branches of the food industry—in countless varieties of foods.

AC'CENT is mono sodium glutamate at its best—produced solely from vegetable sources and always over 99% pure. Many leading food processors use it constantly to raise the flavor standards in familiar products. Progressive chefs in hotels, restaurants, and institutions find that AC'CENT increases the demand for their dishes when it is added to their regular recipes.

AC'CENT, the leading brand of MSG, is no longer unfamiliar to homes all over the country, as homemakers are quickly taking the cue from exuberant food editors who are reporting its wonders.

Now is the time for all those in the food processing industry to find out what AC'CENT can do for them. Only a few comparative tests are needed to measure the difference.

Write for the answers to your questions about adapting AC'CENT to your own formulas. Prove to yourself that AC'CENT does make food flavors sing.

Trade-Mark "Ac'cent" Reg. U. S. Pat. Off.
Printed in U. S. A.

Amino Products
DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION • 20 NORTH WACKER DRIVE • CHICAGO 6, ILLINOIS

New Packages and Products

Frozen Chinese Foods Now Being Marketed

Latest addition to the field of frozen foods is a line of Chinese products prepared by Temple Frosted Foods, Brooklyn, N. Y.

The items, currently being sold in the New York City area, include: Shelled shrimp, shrimp chop suey, boiled rice, fresh ham, fried rice, chicken chow mein, and Chinese egg roll. Also offered are Bar-B-Q spare ribs.

Consumer acceptance of these preparations is reported to be exceptionally good. Future plans call for the addition of other oriental foods as warranted by the market.

Conventional size packages are being used, with wrappings of cellophane. The insert label, of yellow paper with red printing, features a silhouette of a Chinese temple. It was designed by the firm's owner, Bowden Goon, who started the business two years ago.

Container Corp. of America and New Haven Pulp & Board Co. supply the containers. Crowell Printing Co., Brooklyn, N. Y., produces the labels.

Powdered Milk and Cream in Consumer Units

Small tins of dried milk products are now being introduced to the retail trade by the North Star Dairy, St. Paul, Minn.

The dehydrated foods, under the Celesto tradename, are conveniently packaged in measured unit containers to be stored and reconstituted as needed—thus eliminating waste and spoilage.

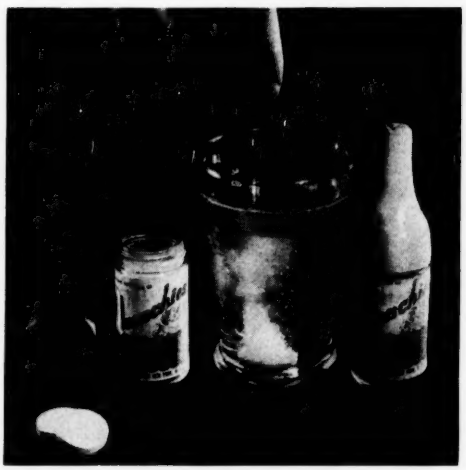
Non-fat dry milk solids, net wt. 3½ oz., are made from pasteurized skim milk and, with the exception of fat substances, have an equivalent food value to fresh whole milk. The contents can be mixed with water to be restored to 1 qt. of skim milk for drinking, baking or cooking.

Powdered whole milk, net wt. 4 oz., made from fresh pasteurized whole milk, makes up into 1 qt. of liquid whole milk when mixed as directed on the label. It may be used in the same manner as fresh milk.

Cream powder, net wt. 3 oz., has 54 percent butter fat and makes up into ½ pt. of light sweet cream. It is recommended for use in coffee, tea, cereals, and puddings, as well as for cooking and baking.

Instant dry creamed milk, net wt. 3½ oz., contains 12½ percent fat. Requiring no refrigeration, it can be added directly in the dry form to coffee, tea, chocolate and other hot or cold beverages.

Termed the first complete line of powdered milk and cream in consumer containers, the products are opportunely offered for use by the economical housewife. After key-city testing, national distribution is planned.



Carbonated Drinks "At the Drop of a Pellet"

Revolutionary development in the soft drink field is the new product Quenchies—novel disk-like tablets which, when dropped into a glass of water, make a delicious, sparkling, carbonated beverage.

Six flavors—cherry, strawberry, grape, orange, lemon and lime—are currently on the market. Root beer, cola, ginger-ale and soda will soon be added.

Twelve wafers are packed in a small glass bottle that has a removable plastic top brightly tinted to correspond with the color of the drink. When empty, these containers can be used by the consumer as shakers for salt, pepper, cinnamon and other condiments.

Besides being economical and easy to serve, the tablets take little storage space and eliminate the necessity of handling bottles. Also, the housewife gains the additional refrigerator space ordinarily occupied by soft drink bottles.

Manufactured by the Wafer Fizz Corp., New York City, it is distributed throughout the country on a franchise basis. Howard Reiffel, the firm's president, designed the container.

(Continued)

WHICH CAP WILL ATTRACT CUSTOMERS?

GOOD PACKAGE design means increased sales. Package design includes the metal cap. This "before and after" illustration shows you how Armstrong's expert package designers can produce a metal cap design that will attract more customers. Time and time again you'll see shoppers pick the package with an appealing, colorful cap design. A sparkling cap design stands out like a shining beacon, "flagging down" the shopper's roving eye.

A potent sales message on the cap serves to remind the consumer of the brand or trade name every time the product is used. If you'd like to see how a good cap design can enhance the appearance of your package, ask Armstrong's designers to show you ideas. Just send a sample package and complete market data to Armstrong Cork Company, Glass and Closure Division, 4203 Prince Street, Lancaster, Pa. Available for Export.

Armstrong's Closures

TURN STANDARD CONTAINERS INTO STANDOUT PACKAGES

WEST COAST REPRESENTATIVE: I. F. SCHNIER CO., INC., SAN FRANCISCO 7 AND LOS ANGELES 12

TONS
TONS
TONS

Revolutionary process?

Yes! Bulk Corn Starch processed with the same precision control of color, texture and purity as National's specialty starches.

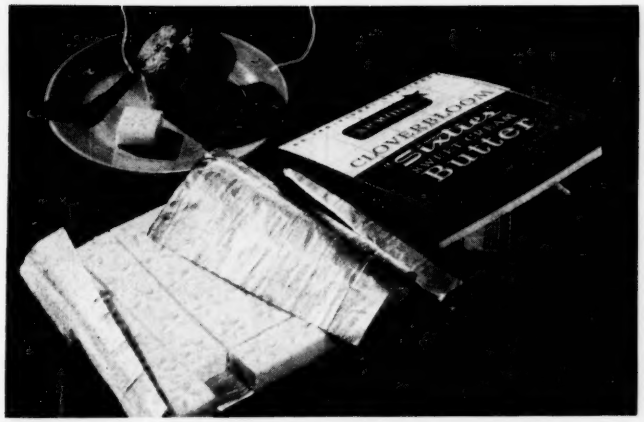
CLEAN? National is the first—*and only*—wet miller to use high-speed, enclosed MERCO centrifuging to separate starch from gluten in a continuous 100% mechanical operation. Separation is now effected mechanically in 3 to 5 minutes—instead of 10 to 12 hours on open starch tables which have been a long countenanced source of contamination. QUANTITY? National can now supply corn starch in any quantity—large or small! The entire processing, including the MERCO operation, requires only one-eighth the time needed by the starch table method. This speeds large quantity deliveries. In addition, National's MERCO system can be completely rebalanced in 3 hours. This permits us to make small or varied runs to meet the specific requirements of the food industry for: ***Hoosier Pearl Grits . . . Molding Corn Starch . . . Thin Boiling Corn Starch . . . Powdered Corn Starch . . . Low Moisture Corn Starch . . .*** and ***Melojel.***

Technical service? Call on our laboratory anytime. Delivery? Prompt CL or LCL shipments from our plants or convenient warehouses.

BULK STARCH
BULK STARCH
BULK STARCH

Write for full details: 270 Madison Avenue, NEW YORK 16; BOSTON, PHILADELPHIA, ATLANTA, NEW ORLEANS, INDIANAPOLIS, CHICAGO, SAN FRANCISCO and other principal cities. In *Canada:* Meredith, Simmons & Co., Ltd., Toronto and Montreal. In *Holland:* Nationale Zetmeelindustrie, N. V. Veendam.

National
STARCH PRODUCTS



"Patty" Form Butter

A flat package containing 60 individual servings of butter with an overall wrap of aluminum foil has been introduced by Armour & Company, Chicago. Reportedly, this is the first time that butter has been offered in this convenient patty form for service in the home.

As well as being saved the job of cutting, the budget-conscious housewife knows the exact number of servings with each pound and can plan accordingly. Every patty is precisely cut, and each one bears a decorative imprint (see photo).

The new butter wrap, an aluminum foil lamination developed by Reynolds Metals Co., is designed to prevent loss of delicate aroma and flavor.

For Cloverbloom Sixties, as the packet is called, the manufacturer uses only U. S. Certified 93 score butter. Distribution is nationwide.

New Fruit Spreads

A new line of apple butter, apple-jam and grape jelly has been introduced under the Wathena Orchard brand label by the St. Joseph Foods, Inc., St. Joseph, Mo.

The brand name was derived from the area—Wathena, Kan.,—where the orchards which furnish the fruit are located. The Concord grapes and Jonathan-variety apples grown in this vicinity have a rich characteristic flavor which gives the spreads an excellent taste quality.

Packed in glass jars, vacuum sealed, the apple butter and jam have a 1 lb. 12 oz. net wt., while the grape jelly scales 2 lb.

Meat With Separate Sauce

Barbecued ground meat, beef, or pork, packed in a can containing a separate Pliofilm bag of sauce, has been introduced by Oscar Mayer & Co., Madison, Wis.

The cans contain 8½ oz. of the cooked meat in natural juices, together with 3½ oz. of the sauce, which is composed of tomato paste, sugar, celery, vinegar, worcestershire-type sauce, onions and spices.

From the experience gained in the development and testing of canned franks with sauce, the manufacturer found it best to have the sauce wrapped in the plastic bag until used — for a fresher and more zestful taste was found to be imparted when sauce was opened and mixed with the can contents at the time of preparing the meal.

(Continued)

Cans of Distinction

HERE ARE CUSTOMER CATCHING CANS

We offer a complete custom service from sketch to a finished product that is exclusively yours.

We also manufacture a complete line of round cans with stock designs for candies and cookies.

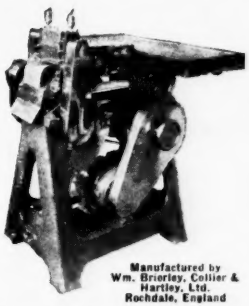
Let Empire quote on your requirements. We should get acquainted.

"No other container protects like the can"

Empire Can Corp.

228 Ashford St. Brooklyn 7, N. Y.
APplegate 7-4701

"SPEEDY" PEEL CUTTING MACHINE



Manufactured by Wm. Brierley, Collier & Hartley, Ltd. Rochdale, England

Cleanest cut, with least waste, for syruped peel and coarse cut marmalade.

Write for Details

distributed by

BROWN BOGGS

Foundry & Machine Co. Ltd.

HAMILTON, ONTARIO

Now wrapping FROZEN FOODS in Metal-end Fibre Cans

as well as in folding cartons

Photos courtesy of Modern Packaging

Model FF in plant of the C. S. Kale Canning Co., Everson, Wash.

Here's good news for frozen food packers. Metal-end fibre cans—which permit the use of high-speed automatic filling and closing equipment—are now being wrapped by our popular Model FF machine. Moreover, you can wrap folding cartons on the same machine, thus maintaining a uniform appearance for your entire line. And you obtain the display advantages of a full-color wrap, with a sales-winning reproduction of the product.

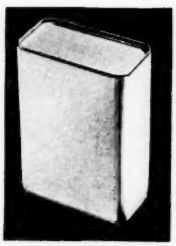
Using printed wrapping material in economical roll form, the Model FF seals the wrapper to the unprinted fibre cans. The use of unprinted fibre cans eliminates the expense of printing small quantities for a given brand, and also the need for maintaining a variety of printed cans in stock.

The wrapper can be applied either before or after the contents are frozen. Whether the container is wet, frosted or dry, a uniformly neat wrap is achieved, because the ends are sealed in such a way that any moisture inside the wrapper can escape.

The Model FF has a speed of up to 100 packages per minute and is quickly adjustable for various sizes.

Get all the facts on the Model FF. Write or phone our nearest office.

The colorful printed cellophane wrapper is accurately registered by electric eye.



The problem of the recessed ends on the can was solved by an end-seal made over a steel blade and heat-sealed.

PACKAGE MACHINERY COMPANY
Springfield 7, Massachusetts

NEW YORK CHICAGO BOSTON CLEVELAND
ATLANTA DENVER LOS ANGELES SAN FRANCISCO
SEATTLE TORONTO MEXICO, D. F.

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

Fudge Mix Repackaged

The dehydrated Oz fudge mix produced by Homix Products, Inc., New York City, and formerly packed in paper cup cartons, is now offered in 13-oz. hermetically sealed cans. After a period of testing and surveying of the market in the New York area, the switch to cans was made in order to lengthen the shelf life and make a more attractive display item.

Made from cocoa, powdered whole milk, sugar, salt and vanillin, the mix has been popular, finding particularly extensive use in the relief foods being shipped abroad.

The new container is supplied and lithographed by Continental Can Co. Roy S. Durstine, Inc., New York City, designed the label, which features three principal characters from the Wizard of Oz books.

Small Size Hams in Cans

A new small-size can of boneless, skinless cooked ham has been introduced by Trunz, Inc., of Brooklyn, N. Y. Weighing but 3 lb. 2 oz., and appropriately termed the "Junior" size, the product has particularly been developed to meet the requirements of small families.

New Frozen Juice Concentrates

Concord grape juice will be the first of several new frozen fruit juice concentrates to be test-marketed soon by Snow Crop Marketers, New York City.

Widespread acceptance of Snow Crop frozen orange juice concentrate in the last two years encouraged the producer, a subsidiary of Clinton In-

(Continued)

Cellophane offers just the combination you need for Successful Packaging

Folding tray plus heat-sealed overwrap produce an inexpensive package designed to preserve doughnuts at peak quality and appearance.

WHY is cellophane winning growing acceptance as *the* wrap for bakery specialties?

Because the exact protective qualities needed to keep baked goods oven fresh and saleable are engineered into it.

That's why you see Sylvania Cellophane types MS and DS on so many bakery products. Their resistance to grease keeps your product appetizing and free from contamination. Their uniform strength and heat sealing qualities mean easy application either by hand or by automatic equipment. Their true transparency offers extra visibility, beauty and sales appeal.

The Sylvania representative will see that you get the right combination of properties you need for your product. Talk over your packaging problems with him. Or write to Market Development, Dept. F-3. You will find us most cooperative.

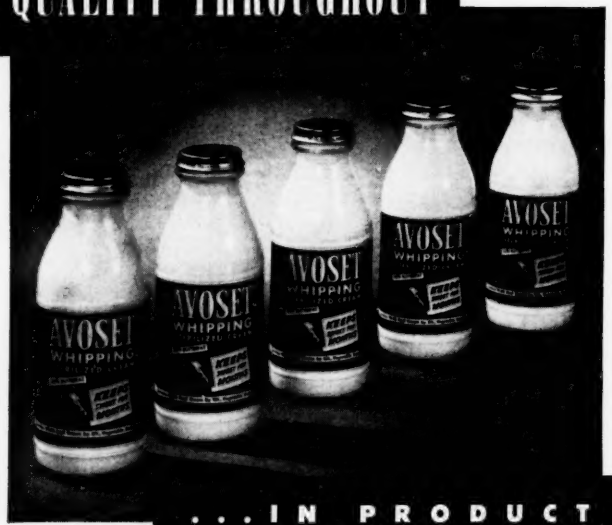
SYLVANIA CELLOPHANE

SYLVANIA DIVISION AMERICAN VISCOSE CORPORATION

Manufacturers of cellophane and other cellulose products since 1929

General Sales Office: 350 Fifth Avenue, New York 1, N.Y. *Plant:* Fredericksburg, Va.

QUALITY THROUGHOUT



. . . IN PRODUCT AND PACKAGING

The makers of Avoset Sterilized Cream — the new dairy discovery that keeps sweet for months — "use Arabol adhesives because they hold labels snug even after days in grocers' refrigerators".

Arabol is proud of the fact that their adhesives are used by Avoset Company.

Since 1885 it has been our aim to supply the one best adhesive for each customer's particular requirements. On this basis we are privileged to serve the leaders in a hundred different industries. See the Arabol representative when he calls. He knows adhesives.

PIONEERING *in the making of* ADHESIVES THAT WORK

THE ARABOL MANUFACTURING CO.

Executive Offices: 110 East 42nd St., New York 17, N. Y.
CHICAGO 50—1835 S. 54th Ave. • SAN FRANCISCO 3—1950 16th St.
LOS ANGELES 11—2262 E. 37th St. • ATLANTA 3—375-377 Whitehall St., S.W.
BOSTON 9—12 Commercial Wharf • PHILADELPHIA 47—600 S. Delaware Ave.
ST. LOUIS 4—2500 Texas Ave. • PORTLAND, ORE.—1233 N.W. 12th Ave.
LONDON E. C. 1—8 Sans Walk Clerkenwell

Adhesives? . . . ARABOL!

dustries, to extend its activities into the production of additional juice concentrates. Pure grapefruit juice and a blend of grapefruit with orange juice are two of the products in the development stage.

Test-market sales performances of the new concentrates will be carefully surveyed, and the data will be used as a guide for future marketing.

South Sea Island Flavoring

Pomegranate grenadine sirup bottled under the label of the famous Trader Vic's restaurant in Oakland, Calif., is the first item of a new line of foods, flavors and spices to be distributed by Schieffelin & Co., New York City.

The firm is one of the oldest drug houses in the country, and this is its initial entrance into the food specialty field.

"Love apple sirup," as the flavoring is appropriately called in south sea island phraseology, is non-alcoholic. It is produced from pomegranate juice, sugar, extracts, and other juices. The sirup is one of the interesting ingredients used to prepare many of the exotic foods and drinks at the popular West Coast eating establishment.

A small booklet attached by string to the neck of each bottle (½ qt.) lists various recipes and suggested ways of using the product.

The label features the image of a beautiful native girl in sarong, against a background of a grass hut and Hawaiian sky.

National outlets are being established with leading food houses, grocery and department stores. Other oriental specialties soon to be distributed by Trader Vic include: Trader Soya Bean Sauce, Mai Kai Sauce, Orgeat Syrup and Chutney.

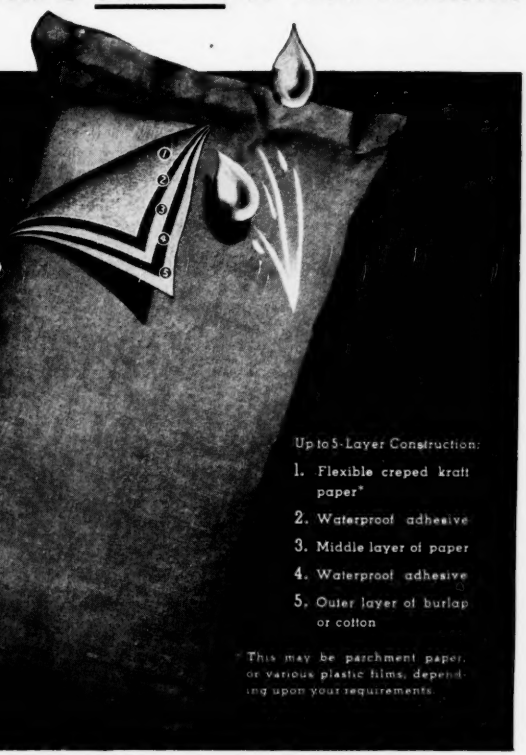
WE CALL 'EM

Waterproof Bags

...BUT...THIS KIND OF PROTECTION IS ONLY ONE OF THEIR FUNCTIONS

Bemis Waterproof Laminated Textile Bags are extra strong, and they're specially constructed to guard against:

- Change in moisture content
- Contamination
- Sifting losses
- Undesirable odors
- Insect infestation
- Loss of aroma



Up to 5-Layer Construction:

1. Flexible creped kraft paper*
2. Waterproof adhesive
3. Middle layer of paper
4. Waterproof adhesive
5. Outer layer of burlap or cotton

*This may be parchment paper, or various plastic films, depending upon your requirements.

If you have a "hard-to-pack" product or one that must stand the rough handling of l.c.l., truck, or export shipment, it will pay you to investigate the advantages of Bemis Waterproof Bags.

BEMIS Waterproof BAGS

Bemis

"America's No. 1 Bag Maker"

BEMIS BRO. BAG CO., Waterproof Dept.
408-C Pine St., St. Louis 2, Mo.

Please send complete information about Bemis Waterproof Bags for

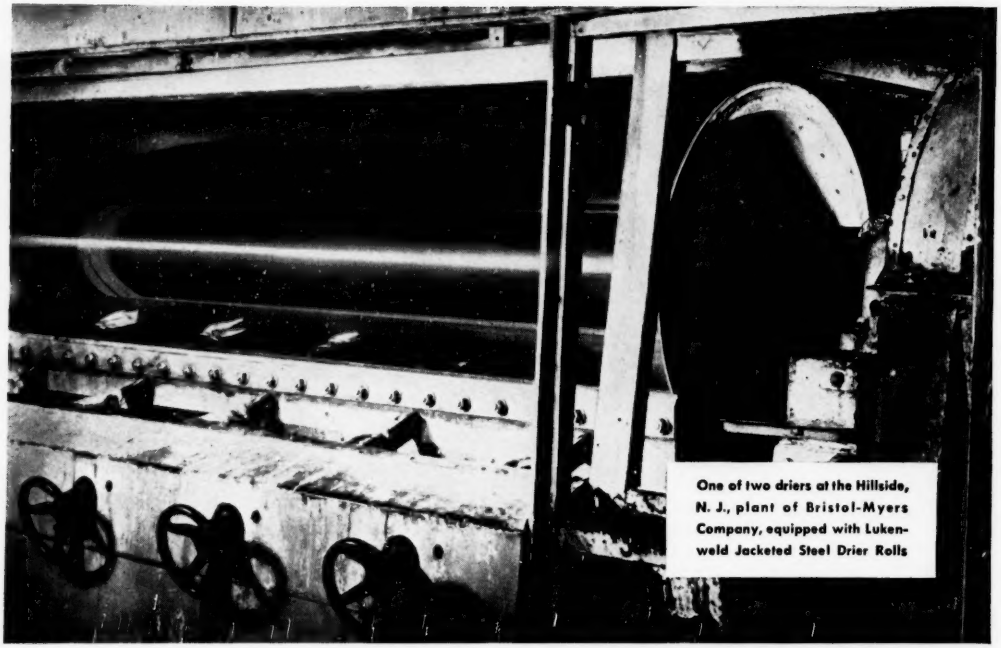
_____
(Product)

Name_____

Company_____

Street_____

City_____ Zone____ State_____



One of two driers at the Hillside, N. J., plant of Bristol-Myers Company, equipped with Lukenweld Jacketed Steel Drier Rolls

Bristol-Myers *Upped Production 41%* with Lukenweld Jacketed Drier Rolls

PATENTS APPLIED FOR

200 pounds of dried, flaked material every 7 to 8 minutes instead of the 10 to 11 minutes formerly required! That's how much Bristol-Myers stepped up output from these machines simply by replacing drum-type rolls of different material with Lukenweld Jacketed Steel Drier Rolls—an average increase of 41%.

No other changes were made. The increased production was entirely due to the increased drying rate and positive method of condensate removal of rolls of Lukenweld design and steel plate construction. Had steam pressure been increased above the 80 psi used in both old and new rolls, the drying rate could have been further increased.

Records since installation of the Lukenweld Rolls in 1938 show a further saving. Despite the action of a 30% saline solution, the steel plate roll faces, which are chromium-plated, have lasted over six years. In contrast, chromium-plated surfaces on the old style rolls had to be refinished every year and a half.

If you have a job calling for roll drying, you can probably do it better and faster with Lukenweld Jacketed Steel Drier Rolls. Bulletin 358 tells you about them. Lukenweld, Division of Lukens Steel Company, 401 Lukens Building, Coatesville, Pa.

We'll lend you "LUKENWELD", a 16mm motion picture with sound, highlighting our methods, facilities and products. Running time: 20 minutes. Write for booking date.

LUKENS
LUKENWELD DIVISION

LUKENWELD
DRIER ROLLS AND DRYING MACHINERY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

Food Industry News

General Plans for IFT Annual Meeting Outlined by Program Committee

Tentative plans for the 1949 annual conference of the Institute of Food Technologists have been outlined by Program Director Emil Mrak, chairman of the Food Technology Division of University of California.

This 9th conference, to be held in San Francisco, will open on Sunday, July 10, with an IFT council meeting, a meeting of section officers, and a wine symposium and reception.

On July 11 there will be a general morning session, the FOOD INDUSTRIES' Award luncheon, afternoon meetings on production and research, and about eight evening round table discussions on such subjects as gas preservation, poultry and egg technology, education, fishery products, and advanced food plant sanitation. The discussion on plant engineering will be headed by Frank K. Lawler, Editor of FOOD INDUSTRIES.

On July 12, concurrent sessions on production and research will be held in the morning, a symposium on the transport of perishables in the afternoon, and the Appert Award banquet in the evening.

On July 13 there will again be concurrent symposia in the morning, the annual business luncheon and meeting at noon, and an afternoon of western entertainment, featuring a ranch barbecue.

The morning of July 14 will be devoted to additional symposia, while the afternoon will be given over to short tours of such attractions as University of California's cyclotron, the USDA Western Regional Laboratory, and Bay Area food canning and processing plants.

Papers already planned for presentation during these convention days cover such subjects as: Control of heat exchangers; free glutamic acid content of fresh, cooked and canned foods; hydrolyzed vegetable proteins as food seasonings; quality control in pineapple canning; effect of blanching on vegetables; and cost control.

Processing or production papers will feature salts, cereals, cured meats and fish, bakery goods, edible fats and oils, and essential oils. Canadian food industries will not be overlooked, and there will be a motion picture on the production and curing of vanilla beans.

Friday, July 15, will wind up the convention, with day-long trips offered to the Napa Valley wine country north of San Francisco, or to the fruit processing area around San Jose.

Concurrent with the convention, and equally attractive, will be the food equipment and supplies exhibition, to be held in the main hall of San Francisco's Civic Auditorium. Some 150 booths are being made available to companies serving all aspects of food handling.

Canada Dry Completes Expansion Program

The extensive plant expansion program pursued by Canada Dry Ginger Ale, Inc., since 1935, has reached its goal, according to an announcement by President R. W. Moore at the company's annual meeting of stockholders, at Jersey City recently. The 13-year development more than quadrupled the number of bottling plants operated by Canada Dry in the U. S., and brought about a four-fold increase in population served through direct delivery.

Further expansion will be carried out by means of licensing other bottlers to produce the complete Canada Dry line, Mr. Moore said. Under this program, 75 bottlers started operations during the 1948 fiscal year, and recent openings have brought the total to 87.

Tracing the history of the company's plant building program, the president observed that at its start in 1935 there were only six Canada Dry plants serving the entire U. S., with 11,000,000 people living in the factory direct delivery areas. New construction, and plant purchases during the war, brought the totals to 22 plants and 33,000,000 people at the end of the war. Since then, seven new plants were built, to serve an additional 11,000,000 population.

New Chairman Appointed For Candy Groups

Theodore S. Stempfel, vice-president, E. J. Brach & Sons, Chicago, has been appointed General Chairman of the National Confectioners' Association's 66th annual convention to be held June 5 to 10, at the Stevens Hotel, Chicago.

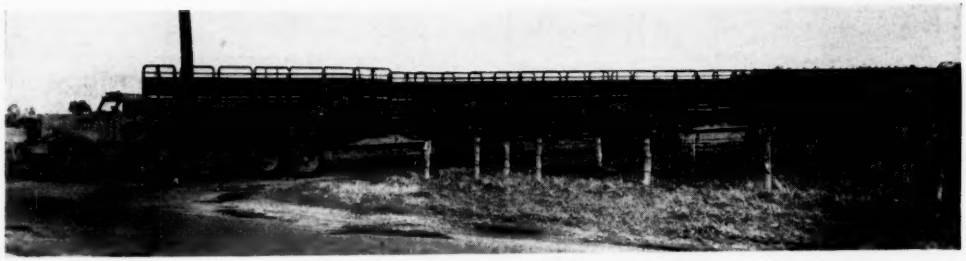
National Confectioners' Association's 23rd Confectionery Industries Expositon, to be held concurrently with the Convention, will be under the chairmanship of David O'Connor, Penick & Ford, Ltd., New York, City.

(News Continued)

Harris & Ewing

Russia Talks About Wheat

For the first time since the war, Russia showed interest in the establishment of an international wheat agreement when the 48 nation wheat conference opened in Washington, late in January. Shown here, from the left, are: Secretary of Agriculture Brannan; the United Kingdom delegation head, T. Sheed-Anderson; and the Russian delegation chairman, Sergei Aleksevich Borisov.



Aussie Cattle Train

Cattle ranchers in Australia's "Outback" decided to do something about transportation for their stock while the rest of the country was making up its mind on railroad building. The answer turned up in truck trains, such as this one, which carries 90 head of cattle or 60 tons of wool. (See story on Pg. 154)

International Treaties Sought by Fisheries

International agreements to regulate and conserve ocean fishery resources are forecast—eventually—in two areas important to U.S. fisheries and fish processors.

These are (1) the Pacific tuna area, involving Mexico and the United States; and (2) the whole northwest Atlantic fishing grounds, involving the U. S. and ten other countries.

The Mexican development began with the signing of a treaty by Mexico and the U.S., setting up a commission composed of four members from each country. The commission will investigate tuna, tuna-like fishers, and bait fish used by tuna fishermen in the Pacific fishing grounds off the coasts of both countries.

No regulatory powers are held by the commission, its sole authority being limited to studying and reporting on the virtually unknown habits of the tuna. Object is to pave the way for regulation, if it is ever needed, to conserve the tuna so that it may be fished economically and not destroyed.

The North Atlantic Development began with the First International Northwest Atlantic Fisheries Conference in Washington last month. Object of the conference was to set up an international commission composed of the countries interested in fishing that area: Canada, Denmark, France, Italy, Iceland, Newfoundland, Norway, Portugal, Spain, U. K., and U. S.

The problem in the North Atlantic is more immediate, since U.S. fishermen have been getting smaller catches of smaller fish in the heretofore productive St. George's banks area.

The international commission contemplated by the conference—like the U.S.-Mexico commission—would have no regulatory powers. But it would have the authority (when its studies reveal a situation that needs immediate attention) to recommend action.

Eventually, it is hoped that the North Atlantic Agreement may become similar to the International Whaling Agreement, which now regulates whaling in the interests of preventing exhaustion of the available natural economic resource.

Food Workers' Exemptions May Be Eliminated

The Truman administration is supporting measures in the 81st Congress to broaden the coverage of the social security and wage-hour laws in a way that would narrow or eliminate the exemption now held by farmers and some food processors.

In the social security field, the old-age and survivors' insurance, and unemployment compensation, would be extended to include all processors and even all agricultural labor.

At present, coverage of both the social security laws and the wage-hour law are the same. In amending the wage-hour law of 1938, however, it is planned to retain the exemption for agricultural workers, although the exemption for food processors would be narrowed.

Also, the overtime leeway allowed in seasonal industries would be reduced from 56 to 50 hours a week, and from 12 to 10 hours a day.

Testifying before the House Labor Committee, Secretary of Labor Maurice J. Tobin asserted that extension of the wage-hour law to most industries "affecting" commerce would bring "several million additional workers" under the law. Others have estimated it would run as high as 5,000,000.

"The unworkable agricultural 'area of production' exemption should be dropped," Tobin said. "At the same time, care should be taken to insure overtime tolerance in certain seasonal industries."

Tobin testified in behalf of a bill draft, not formally introduced, which formed the basis for the House committee hearings. This bill would, in addition to the above:

1. Raise the minimum wage from 40 to 75c. an hour, with an ultimate objective of a $1 minimum. Industry committees would recommend minimums between 75c. and $1, which would "not substantially curtail employment in the industry" and with due regard for economic and competitive conditions.
2. Transfer administration of the law from an independent administrator to the Secretary of Labor and give him the power to make binding rulings and interpretations.
3. Permit the Labor Department to sue for any back wages due employees.
4. Extend the Statute of Limitations to four years instead of the present two years under the Portal-to-Portal Act of 1947.
5. Strengthen the child labor section by a direct prohibition of "oppressive child labor."
6. Define "regular rate" on which overtime must be computed so as to eliminate most of the "overtime on on overtime."

Food Company Statements Showed Varied Earnings

Wilson & Co. and The Best Foods show drastic declines in earnings in recent financial statements, while Ward Baking Co. reveals a sharp increase.

The Wilson report, covering a 52-week period ending October 30, indicates net earnings of $6,702,578 on sales of $704,664,524. In a 53-week period computed for the previous year, earnings were $15,448,823 on sales that were over 2 percent less than the most recent report.

The Best Foods consolidated net earnings for the first six months of the 1948–49 fiscal year were $2,874,208, compared with $4,469,796 for the corresponding period the year before.

Ward Baking Co., on the other hand, showed net income of $3,685,443 on net

product sales of $86,072,667, for the fiscal year ending December 25. Earnings for the previous year were $2,531,425 on sales of $80,547,804.

Food Technologist Dies On Way to Convention

Harry Carlton, food processing specialist for the past seven years with the Agricultural Extension Service, University of Tennessee, died enroute to Atlantic City, January 14, and was buried in Middleburg, N. Y., on the following Wednesday.

Mr. Carlton had left Knoxville on Thursday, January 13, to attend the 42nd annual convention of the National Canners Association. He was found dead in his berth as the train pulled into Philadelphia early on Friday. A physician there attributed death to cardiac failure. The body was cremated in Philadelphia, the ashes being sent to Middleburg, former home of Mrs. Carlton, for burial. Services were conducted by the Masonic Lodge.

Mr. Carlton, a nationally recognized authority on frozen foods and food processing, and author of several books, bulletins and technical articles on frozen foods, was to have taken part in the discussion at the canners' convention. He had been active for the past several months with the committee planning construction and facilities of the new food processing building at the University of Tennessee.

Trainer Gets PMA Post

Leonard R. Trainer is the new director of the Food Distribution Programs Branch of the Production & Marketing Administration according to Ralph S. Trigg, Administrator.

Mr. Trainer succeeds Paul C. Stark, who resigned as director of the branch, last July. H. C. Albin, associate director, who has been serving as acting director in recent months, will continue as the associate with Mr. Trainer.

Experimental Plant Planned By Bottlers Co-Op

The Bottlers Franchise Associates, Inc., a cooperative association of independent bottlers in New England and New York State, is planning to open an experimental bottling plant in the near future, it has been announced by Mr. A. A. Cohen, BFA vice-president.

The plant, to be owned and controlled by BFA cooperative member bottlers, will be in the nature of a "pilot" facility for the benefit of the membership. In it, the most practical methods of bottling plant operation, management, maintenance, sales, service, and advertising will be worked out to eliminate the costly experimentation that would be necessary if attempted by individual members.

The second and equally important function of the plant will be in its Training School for the personnel of BFA member bottlers. Here, production department trainees sent to the school by members, will be trained in the operation, upkeep and repair of all types of machinery under actual working conditions. Members' employees will be given courses in flavor making and sirup mixing, and management personnel will study the most modern procedures in office systems, production control, promotion, merchandising and advertising.

Complete courses will take twelve weeks over a period of one year. Trainees will work one week per month in the experimental plant and spend the balance of each month in their employers' plants.

Individual BFA members will be required to invest no money in the project, since the entire program will be financed by the BFA Cooperative Bottle Inventory Financing Division. All instruction will be given by qualified specialists furnished by the BFA headquarters free of charge.

Machinery training will be supplied by equipment manufacturers, who will furnish a service man eight hours per week, and advertising instruction will be furnished by the Dwight Miller Agency of Providence, advertising consultants to the BFA.

Dairy Fund

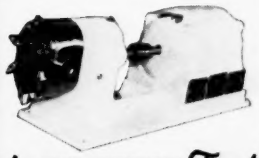
A. W. Rudnick, secretary of the National Creamery Buttermakers' Association and extension dairyman at Iowa State College, presented a check for $2,000 to the University of Minnesota Farm to establish the O.A. Storvick Memorial Fund intended to stimulate college student interest in quality dairy products. The fund is named to honor O.A. Storvick, a nationally known butter judge.

(News Continued)

WATEROUS SANITARY PUMPS

STAINLESS STEEL and NICKEL ALLOY

100% SANITARY



for PUMPING Food Products of all Kinds

APPROVED BY ALL LEADING HEALTH DEPARTMENTS

POSITIVE ROTARY ACTION

ONE PIECE ROTOR AND SHAFT ASSEMBLY

SLOW SPEED ELIMINATES AGITATION

NO THREADS, SPLINES OR KEYWAYS IN PUMPING CHAMBERS

SANITARY MECHANICAL SEALS

NO BEARING SURFACES IN PUMPING CHAMBERS

REVERSIBLE INTAKE DISCHARGE PORTS

Ball bearing construction throughout, here is a modern advanced design in positive rotary pumps for handling food products of all kinds. A simple, efficient design and construction that assures long efficient service, the heavy duty precision ball bearings control both radial and end thrust loads on shafts and rotors. Bearings and timing gears operate in oil to assure long life and quiet operation . . . no internal metal friction in the pumping chamber.

There are no internal shaft or seal threads to contaminate your product. All liquid contact parts are removable for easy cleaning. Its slow pump speed eliminates agitation or aeration of product being pumped . . . capacity is in direct proportion to the pump speed . . . Waterous Sanitary Pumps can be operated at speeds ranging from 50 to 600 r.p.m.

Check the features emphasized and you'll see why food product plants prefer Waterous Sanitary Pumps for high quality, sanitary construction and efficient service backed by 62 years of continuous pump manufacturing.

Write for complete information to:

WATEROUS CO.
St Paul 1, Minn.

DESIGNED AND MANUFACTURED BY EXPERIENCED Engineers

Waterous Dependable

SINCE 1886

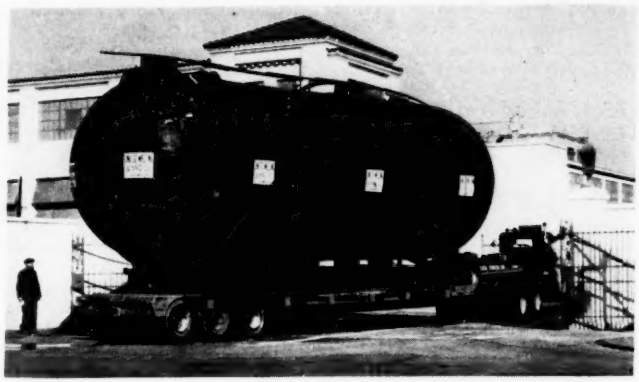
Like Real
OLD FASHIONED
SERVICE?

We have over
800 people
to *serve* you!

Drake OWNER-MANAGEMENT assures you that this service will always be prompt, courteous. Our personnel strive to make your stay with us a delightful experience in warm hospitality, personal service.

EDWIN L. BRASHEARS
President
THOMAS BURNS
General Manager

the LOOP
and the LAKE
Meet at the
DRAKE
Chicago



Need a Pressure Cooker?

Here is a retort that gives the food processor something to shoot at. Measuring 43 ft. in length, 12½ ft. in diameter, and 15 ft. in height, the pressure vessel is being shipped to Firestone Tire & Rubber Co.'s California plant, where it will cure the largest rubber self-sealing cells now being made.

PROCESSING

Hydroquinone Ruled Out As Fat Preservative

Permission to use hydroquinone as a preservative in animal fats, and in shortening containing animal fats, has been cancelled by meat inspection division of Bureau of Animal Industry, effective July 1. This action followed a decision by Food & Drug Administration that hydroquinone is a poison within the meaning of the Food, Drug & Cosmetic Act.

Original application to use hydroquinone as a fat preservative was granted on the basis of a satisfactory chronic toxicity report of pharmacology tests. Subsequently, results of acute toxicity tests showed discrepancies, and some fatalities of test animals (rats), which have caused Food & Drug Administration to reverse its former position of approval.

Public Patent Granted For Citrus Process

A public service patent covering a basic process widely used in manufacturing frozen concentrated citrus juices has been granted to three members of the Florida Citrus Commission's research department.

The patent, based on research conducted in 1944 and 1945 by Dr. L. G. MacDowell, and Dr. Edwin L. Moore and Dr. Cedric D. Atkins of Winter Haven, is assigned to the United States government as represented by the Secretary of Agriculture. The experimental work was conducted cooperatively with the Department of Agriculture at its citrus products laboratory in Winter Haven.

Said Walker: "Dr. MacDowell and his associates in the Florida Citrus Commission research department, in assigning the invention to the United States, have dedicated the process they developed to the free use of the citrus industry, and any limitation on the use of the patent would be in the hands of the Secretary of Agriculture." The process has been successfully used with orange juice, tangerine juice and grapefruit juice, and also can be applied to other fruit juices, Dr. MacDowell said.

Salmon Waste Utilization Is Explored by USDC

A second report—*Utilization of Alaska Salmon Cannery Waste—Part II.*—was recently published by the Industrial Research & Development Division, Office of Technical Service, U. S. Department of Commerce.

In Part I of this report, published last year, the authors pointed out the necessity, the possibilities, and the difficulties involved in utilization of salmon waste, and what studies would have to be undertaken. In Part II, some of these studies and the conclusions drawn are discussed.

About 35,000 lb. of salmon waste, much of it collected directly from the "Iron Chink" in Alaskan canneries, was ground or sorted, then quick frozen for shipment to the various cooperating laboratories.

Studies on utilization of salmon eggs for production of cholesterol, protein, and industrial fat revealed that, con-

trary to expectations, salmon eggs were too low in cholesterol to be profitably processed only for this constituent. Protein, fat, and lecithin fractions, however, appeared to be of high quality and sufficient quantity for commercial exploitation.

Investigation of the value of Alaska salmon waste as a source of fish hatchery feeds determined that salmon viscera had approximately the same amount of protein as beef liver (standard for fish hatchery diets), but a lower vitamin content.

In an evaluation of salmon head oil for addition to canned salmon, the oil was obtained by two processes—boiling and alkali digestion—and organoleptic tests were conducted. A slight but significant preference was shown for the canned salmon samples without added oil because of a faint persistent aftertaste. Researchers noted that oil prepared by pressure cooking the heads should be tested. Storage tests indicated that samples containing added oils developed undesirable changes more quickly.

Salmon cannery waste was also processed in various ways to determine the most effective procedure for recovery of vitamin A oils. Results indicated that waste should be ground or shredded; agitated during digestion; digested for 50 minutes in a 1½ percent sodium hydroxide-water solution at 190–200 deg. F., then allowed to stand for about 15 minutes. The top oily layer can then be decanted and centrifuged.

Originally, a long term research program was planned on utilization of salmon waste. But because of the liquidation of the Industrial Research & Development Division, its financial backers, the program had to be terminated within one year. The projects included in the second part of the report were chosen because some indication of their value could be arrived at before termination of the program.

Survey Tells Why Renters Discontinue Lockers

Faulty packaging, which resulted in off-taste and drying out of meats and poultry, was found to be the leading cause for the discontinuance of locker rentals. This was determined in a recent survey of 1,000 former locker holders.

A total of 380 women made such statements as "the meat tasted funny" or "our chickens were dry." Another 225 mentioned monotonous variety of meats, strange looking cuts, and similar complaints traceable to faulty butchering in the plant. Discourtesy on the part of plant employees ac-

(News Continued)

Everyone has problems

Try again Jones . . . I think I saw it move.

VICTOR CHEMICAL WORKS

If yours happens to be
PRODUCT CONDITIONING

Investigate

VICTOR TRICALCIUM PHOSPHATE

One of the most annoying problems confronting many manufacturers is the natural tendency of certain products to cake. However, producers of such products as salt, powdered sugar, powdered milk drinks, sulfur insecticides, and resin adhesives are solving this problem through the application of Victor tricalcium phosphate as a conditioning agent. It is preferred in that it mixes easily, has little tendency to separate out, and has great moisture-adsorption capacity, thus enabling the product to remain free-flowing and non-caking. For additional information, write today or mail the handy coupon below.

VICTOR CHEMICAL WORKS • 141 West Jackson Boulevard, Chicago 4, Illinois

Investigate Now! MAIL THIS COUPON TODAY!

Victor Chemical Works
141 West Jackson Blvd., Chicago 4, Illinois

Gentlemen:
Please send additional information on Victor tricalcium phosphate for conditioning.

Name _____ Title _____

Company _____

Street _____

City _____ Zone _____ State _____

V7

What's your

PACKAGING PROBLEM?

If you want a simple ... dependable ... economical solution for your packaging problems, check with Union Special. For more than fifty years, Union Special has worked in close cooperation with makers of bags, conveyors, and bag filling and weighing equipment to produce specially designed bag closing machines that meet the needs of industry. Union Special equipment includes machines for closing bags of all types and sizes. Experience gained in handling bag closing problems in many different fields is your assurance of complete satisfaction. Ask for recommendations on your particular problems. Literature on request. UNION SPECIAL MACHINE CO., 450 N. Franklin St., Chicago, Ill.

Union Special

Bag Closing Machines

Wide World

Throw It If You Can

The diners here don't seem to have too much confidence in the pie cutting abilities of President Ralph A. Van Meter, of the University of Massachusetts. But he successfully apportioned the 524-lb. pie, which used up 100 lb. each of apples and cranberries, 75 lb. of sugar, and other pie making ingredients in proportion.

counted for 23 cancellations, while the rest offered reasons beyond the control of the plant operator, including 102 who had acquired home freezers.

The survey grew out of growing reports from managers that rentals were being discontinued "because they were no longer needed," or because the renter was buying a home freezer. It was apparent that the managers were not getting the complete story, due in most cases, to friendship or close association between manager and renter.

The survey was conducted during the past year by Locker Management. The personal interview basis was employed, using lists supplied by locker plant managers in various sections of the country. A report, *Why 1000 Women Gave Up Their Lockers*, was later sent to each manager participating.

F&DA Food Standards

Bread hearings resumed late in January to discuss use of emulsifiers or bread softeners, and a number of other phases of the proposed bread standards. Elaborate presentations of data on emulsifiers, complete with toxicological data, were scheduled by a number of industry spokesmen. Whether toxicology could be completed by the planned February 25 recess was not clear. After the bakery engineers' meeting in early March, the hearings will be resumed in Washington on March 21, taking up performance data on the emulsifiers. Mono- and diglycerides were scheduled for early April, and will be followed by oxidizing agents. Final adjournment is hoped by May.

Canned corn will be the subject of hearings on standards of identity, quality, and fill of container, beginning on March 15. Proposed standards were printed on page 489 of the February 4 *Federal Register*.

Amendments Requested

Canned potatoes standard will be discussed at a hearing on March 14, upon application "of a substantial portion of the interested industry" requestamendment of the present standards of identity for canned potatoes "to provide for the use of purified calcium chloride, calcium sulfate, calcium citrate, or monocalcium phosphate or any two or more of these calcium salts in limited amounts as optional ingredients for firming the potatoes, and to provide for label statement of such optional ingredients." This announcement was also in the February 4 *Federal Register*.

Tentative orders on standards of identity for *cheeses, salad dressings* and *frozen fruits* were still awaited in early February. They will probably appear within the next month or six weeks.

Canned oyster standards of identity are still in litigation. Food & Drug Administration's brief was filed early in December, with argument before the 9th Circuit Court of Appeals sched-

uled for February 18. Willapont Oysters hope that the standards will be amended through this court action, although F&DA rulings to date have given no hope for exception. Court decision may be announced during March.

Grade Standards

Frozen pineapple, celery stalks, poultry, shell eggs, also fees for inspection and certification of fruits, vegetables, and other products have been the subjects of recent action by Production & Marketing Administration of U. S. Department of Agriculture.

Frozen pineapple grade standards have been issued for the first time by publication on page 8321 of the December 25 *Federal Register* (page 144, Nov. '48 FOOD INDUSTRIES). Effective date is January 25.

Celery stalks may be covered by U. S. consumer standards, if the proposals appearing on page 295 of the January 20 *Federal Register* are carried out. Three grades are proposed, with detailed provisions for the proposed grading characteristics. February 9 was set as the date by which comments should be submitted.

Poultry and Egg Standards

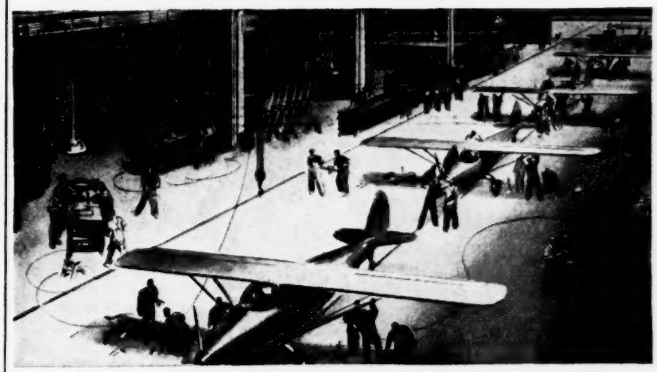
Dressed and ready-to-cook poultry will be covered by standards, grades, and sanitary provisions in the spring of 1949, if authorization of PMA Administrator Trigg is carried out. Industry Advisory Committee recommendations have been submitted to the poultry branch of PMA following a series of regional and national industry conferences last year. Following a Kansas City meeting of the Industry sub-committees on February 5, proposed tentative standards and grades are to be submitted to approximately 2,000 industry representatives for review and suggestions before final draft and issuance.

Shell eggs will soon have U. S. specifications and weight classes for wholesale grades, based upon U. S. standards for quality of individual shell eggs, and superseding the tentative U. S. specifications and weight classes for wholesale grades which became effective February 1, 1948. February 12 (1949) was the date by which comments on the proposal should be submitted. This proposal, "substantially the same as the tentative U. S. specifications and weight classes" effective a year ago, was printed on page 382 of the January 28 *Federal Register*.

Fees. Increased fees for grading, certification, and standards for fruits, vegetables and a few other products

(News Continued)

Seven new planes completed ...at a cost of $4.30!



New planes can't fly without control cable, and this manufacturer needed some—fast. He got it the same way he regularly gets many supplies and parts—by Air Express. Ordered in A.M., delivered to plant same day. 500 miles, 28 lbs., Air Express charge only $4.30. So production continued without a break.

$4.30 included pick-up and delivery at no extra charge—and receipt for shipment. All this, plus the *world's fastest shipping service*. That's Air Express—used with profit by every business.

Shipments go on all flights of Scheduled Airlines. Speeds up to 5 miles a minute—no waiting around. Direct service to over 1,000 airport cities, air-rail for 22,000 off-airline offices.

Facts on low Air Express rates:

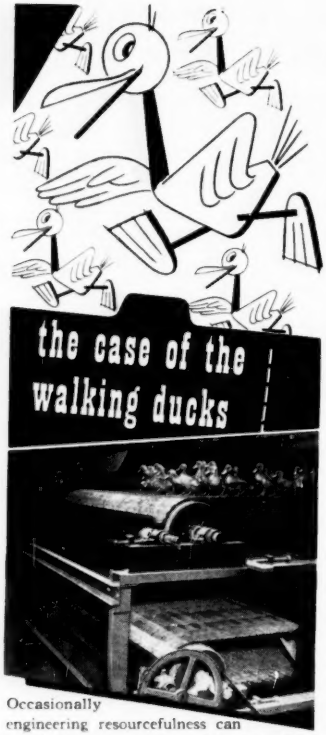
22 lbs. of new fashions goes 700 miles for $4.73.
6-lb. carton of new jewelry line goes 1,000 miles for $2.24.
Same day delivery in both cases if you *ship early*.

Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
GETS THERE FIRST

Rates include special pick-up and delivery door to door in principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.



Occasionally engineering resourcefulness can spotlight an otherwise plain industrial product with a new and unusual use . . . such as the case of this Woven Wire Conveyor Belt installation in a duck brooder.

Newly hatched ducklings, it seems, have to be kept moving to be kept alive. Placed on this specially built woven wire belt moving at a slow rate of speed, the ducklings remain there for eight days . . . continually treadmilling away from the falling end of the belt. Mortality rate dropped to zero. By-product recovery . . . duck droppings for fertilizer . . . is aided by the open mesh of the woven wire belt.

Even if you don't operate a duck hatchery, call in a Cambridge engineer whenever you have a problem concerning the movement of materials or products during processing. Let him explain the superior construction features of **CAMBRIDGE Woven Wire Conveyor Belts.**

This illustrated 130 page catalog--FREE--to men concerned with production control. WRITE TODAY.

Cambridge
WIRE CLOTH CO.
Department Q • Cambridge 3, Md.
BOSTON • NEW YORK • BALTIMORE
PITTSBURGH • DETROIT • ST. LOUIS
CHICAGO • SAN FRANCISCO • HOUSTON

Feeding Time on the Range

It's an old story by this time, but back there in late January the hay lift was in full stride on the snow covered ranches of the Far West. These cattle on a ranch near Lund, Nev., had a photographer to witness the serving of their meal. After traveling 65 miles in 25-below-zero weather on a state guard tractor, the photog began to wonder how he ever happened to get into this business in the first place.

were the principal changes in PMA regulations which have been recently revised. Basic carlot fees have been raised from $6.00 to $7.50, and the hourly rate has been raised from $2.50 to $3.00. Other details of the revised regulations will be found beginning on page 211 of the January 15 *Federal Register*. Meat grading service fee was also raised, from $2.70 to $3.00 per hour, effective February 1.

New High-Yield Cucumber Developed in South

Magnolia, a new variety of pickling cucumber is being released this year by the Mississippi Experiment Station. It was developed by W. S. Anderson, head of the horticulture department, and resulted from several generations of inbreeding and selection in the progeny of a cross between national pickling and an unnamed hybrid.

Tests over the past three years indicate that the new variety will approximately double the yield produced by the standard pickling variety. With good skin and dark green color, it is considered to be of better grade than standard varieties.

New MIT Lab

The Massachusetts Institute of Technology contemplates the construction of a $2,000,000 laboratory to house the institute's work in biology-nutritional biochemistry and food technology. This proposed construction is part of the $20,000,000 program recently announced by MIT. It has long been hoped to have a combined building for the departments of food technology and biology. The research development committee of the corporation will report on the program at commencement next June.

Christie Award

George F. Stewart, associate director of the Iowa Agricultural Experiment Station, Ames, Iowa, received the $500 Christie Award January 21 from the Poultry & Egg National Board, at its annual meeting, in Chicago.

Dr. Stewart has worked to improve quality and palatability of dried eggs for lend-lease and the armed forces, and he is credited with the establishment of optimal conditions for freezing and frozen storage of poultry products.

He has also made many contributions to scientific literature, and is a co-author of over 40 publications in the field of poultry products technology and of a textbook, *Advances in Food Research*.

Record Macaroni Output

Production of macaroni products for 1948 reached an all time high, according to Glenn G. Hoskins, Chicago. Output is indicated at 1,139,747,000 lb. of macaroni and noodle products. This can be compared with the yearly average of 677,614,000 lb. for the five prewar years, 1937-1941 and 967,903,000 lb. for the war years, 1942-1946. The highest year, prior to 1948, was 1946 with 1,107,221,000 lb.

Exports in the first six months of 1948 totaled 198,424,780 lb. valued at $23,008,345. Exports to Oct. 31 totaled

220,121,556 lb. valued at $25,592,271. Out of the ten months total, Italy took 176,554,350 lb. Macaroni exports to Italy are now completely barred and there is no evidence that Italy will take macaroni products from the U. S. in 1949. Exports to other countries are expected to continue and to reach 50,000,000 lb. Domestic consumption is predicted at 850,000,000 lb. and Armed Forces at 50,000,000.

DISTRIBUTION

Consumer Food Buying Studied by R&MA

Basic information about the U. S. consumer's postwar food buying habits is being assembled for the first time by the Department of Agriculture, with Research & Marketing Act funds.

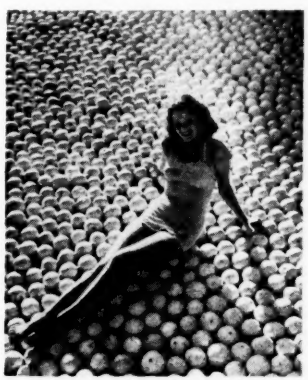
First part of the nationwide consumption survey has just been published. Reports in the series yet to be issued will cover:

1. Spring and fall 1948 surveys in Birmingham, to get a three-season picture—and similar three-season studies in Minneapolis-St. Paul, San Francisco, and Buffalo.

2. A spring-1948 survey of 68 cities from coast to coast.

Among the findings in the Birmingham report were some that might be expected: Higher income groups spent more for food and for higher quality foods than the lower income groups.

(News Continued)



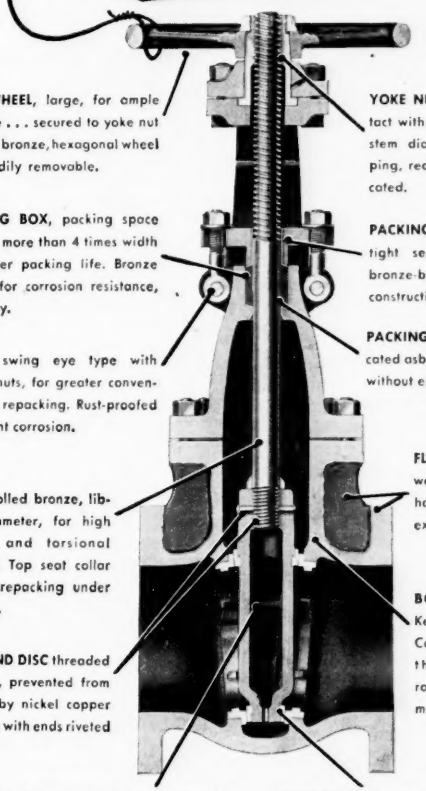
Wide World

Here We Go Again

What with Fl's new look, and all, we thought we had enough sparkle in our pages, but according to this picture's caption, they have a large crop of grapefruit down in Florida and something must be done about it. Always glad to help the industry.

Precision Engineering Makes this KENNEDY VALVE Rugged and Dependable...

KENNEDY STANDARD IRON BODY WEDGE GATE VALVE Fig. 0611, outside-screw-and-yoke. Service up to 125 lb. p.s.i. steam; 200 lb. p.s.i. water, oil or gas. 1½" through 48" sizes available.



HANDWHEEL, large, for ample leverage . . . secured to yoke nut by large bronze, hexagonal wheel nut, readily removable.

STUFFING BOX, packing space depth is more than 4 times width for longer packing life. Bronze bushed for corrosion resistance, durability.

BOLTS, swing eye type with washer nuts, for greater convenience in repacking. Rust-proofed to prevent corrosion.

STEM, rolled bronze, liberal diameter, for high tensile and torsional strength. Top seat collar permits repacking under pressure.

STEM AND DISC threaded together, prevented from turning by nickel copper alloy pin with ends riveted over.

WEDGE DISC, reversible and interchangeable, reinforced by integrally cast interior posts. Openings permit drainage in any position.

YOKE NUT, bronze, thread contact with stem at least 1½ times stem diameter eliminates stripping, reduces wear, easily lubricated.

PACKING GLAND machined for tight seal with stuffing box, bronze-bushed at stem. Slotted construction simplifies repacking.

PACKING, molded rings of lubricated asbestos maintain tightness without excessive gland pressure.

FLANGES are heavy and well filleted. Flanged ends have reinforcing ribs for extra strength.

BODY AND BONNET, Kennedy Higher Strength Cast Iron, generous metal thicknesses and well rounded corners provide maximum strength.

DISC RINGS, bronze, wide and thick, forced into dove-tailed grooves in disc to form practically integral construction.

Write for Bulletin No. 50. BUY FROM YOUR LOCAL DISTRIBUTOR

THE KENNEDY VALVE MFG. CO.
1065 EAST WATER ST.
ELMIRA, NEW YORK
VALVES • PIPE FITTINGS • FIRE HYDRANTS

OFFICE-WAREHOUSES IN NEW YORK, CHICAGO, SAN FRANCISCO • SALES REPRESENTATIVES IN PRINCIPAL CITIES

CRANBERRY GROWERS LIKE
Frick Refrigeration

And have used it over thirty years!

Frick equipment serves this industry in three ways: for short-term storage at 32° F; for long-term storage at –5°; and for freezing the berries to be made into juice — thus carrying the rich color of the skin throughout the liquid.

Cranberry Storage at Sandwich, on Cape Cod, Massachusetts.

Freezer for Cranberries at Barnstable, Mass.

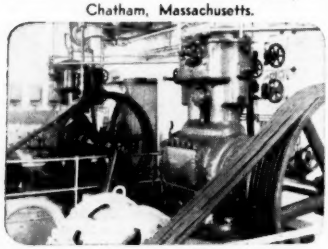
The three cranberry plants on Cape Cod use seven big Frick refrigerating machines: two others, still bigger, have lately been ordered.

Cranberries in Long-Term Storage at Chatham, Massachusetts.

For that special cooling job of yours, get the recommendations of the nearest Frick Sales-engineer.

DEPENDABLE REFRIGERATION SINCE 1883
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

Frick Compressors in Cranberry Plant at Chatham, Massachusetts.



However, some of the detailed figures are revealing. For instance:

1. Fourteen percent of the families spent more than $10 per person per week for food, but 11 percent spent less than $3.50. USDA estimates that balanced low-cost diet in Birmingham would cost $4 to $5.

2. Birmingham families are buying more dairy products. In 1936, white families there used 2.6 qt. of milk or the equivalent in cheese, cream or ice cream, and Negroes only 1.2 qt. A year ago, the average per person per week was 4.2 qt.

3. High income groups used about twice as much bakery products as lower-income groups. But lower-income groups spent more per family per week on flour and other cereals.

Food Stamp Plan Tests Urged by Brannan

The prewar food stamp plan devised by the government to move surplus foods and provide minimum diets for low-income families is due for a postwar revival.

The idea now is to tie it in with the Department of Agriculture's long-range program to try to beat the surplus crop problem by finding new markets and outlets, rather than by limiting production through acreage controls.

Secretary Brannan wants $3- or $4,000,000 to test various mechanisms for subsidized distribution of food to low-income people. The plan is to use food stamps to induce people to eat better.

Tests will be run in both metropolitan and small-town areas, in various parts of the nation. Established retail outlets will be used in all cases.

Here are some of the different approaches Agriculture wants to try: Giving the stamps away as well as selling them at cut-rates; making stamps redeemable for any food purchase or, alternatively, only for surplus items, requiring tie-in purchases of, say, surplus potatoes to get meat.

It is figured that American families must eat about 10 percent more food than they did prewar to make a real dent in the problem of surplus farm crops, which may be pressing hard on the Administration this year.

Senator Aiken, Vermont Republican who had the Democratic Administration's support for his flexible price support program, already has a bill in which he would give legislative authority for the stamp plan.

Aiken's bill has these provisions: Each person should consume each week, no less than specific quantities of certain basic foods—5 quarts of milk or equivalent, 4 eggs, about 2 lb. of meat, for instance. But no family should have to pay more than 40 percent of its income to get these quantities of the basic diet.

To get the quantities of food products into the hands of those who would spend more than 40 percent of their wages, food stamps—instead of money—would make up the difference.

Families would apply for stamps and pay the 40 percent of their income (whatever it might be) to get stamps worth enough to buy the minimum diet for the family. Thus a family might pay $40 (if its income is $100) and receive stamps worth $60, if $60 is found to be the price of the minimum diet.

Naturally, at this stage, the Aiken Bill's provisions are subject to revision or amendment—or it might be tossed aside in favor of a Democratic bill to carry out the same idea.

A beginning of the experimentation, however, is almost certain to get underway this year, whether or not legislation is passed. Research & Marketing Act funds could easily be allocated to such a project on a small scale. R&MA is in the budget for $19,000,000 for fiscal 1950; its budget this fiscal year was $13,500,000.

USDA Studies Marketing Of Wheat Products

The drive by Secretary of Agriculture Brannan to bring down the price of bread apparently was more than campaign talk. The Department of Agriculture has issued a 16-page report, complete with tables of figures, charts and graphs, showing that between January and October last year:

1. Wheat prices dropped 30 percent, from $2.81 to $1.98,

2. Flour dropped 15 percent, from 9.6 cents per lb. to 8.2 cents, but

3. the price of bread went up .7 percent, from 14.4 cents to 14.5 cents per lb.

To drive home its point a little harder, the Department's analysis shows that eight bakers, eight millers, and eight retail food chains increased their profits, figured on investment, from prewar levels of 5-11 percent to 13-18 percent in 1947.

The report is the result of a number of marketing studies financed by Research & Marketing Act funds. Among other reports now planned or already underway are:

1. A study of the relative costs of shipping tomatoes from North Carolina to New York in one kind of container as compared with another. This marketing efficiency study was expected to report its results soon.

2. Another study on southern peaches shipped to market in New

York. This would analyze the shares of the final retail price that go to packer, wholesaler, retailer, shipper—and how much the grower gets.

In an announcement attached to the wheat-flour-bread report, O. V. Wells, chief of the Bureau of Agricultural Economics, noted that BAE did not include any information about the processing costs that make up the margins between the wheat growers and the consumer price.

But he "hoped" that millers and bakers would turn over to BAE the cost figures BAE would like to have to account for the spread between wheat farmer and bread eater.

The report states of the bakers and millers: ". . . . industry competition may be at a low ebb because milling and baking did not expand during the period 1940-48, whereas the domestic flour-and-bread consuming population increased."

On the other hand, the text does note that rigidity of marketing charges when retail prices are falling "creates a strong pressure to force the farmer's return downward." The farmer in such a situation, the report states, gets what is left of the consumer's dollar after the marketing costs have been deducted.

Frozen Foods Distribution Developed by Dairy

An experiment in selling frozen foods by a dairy and delivering the product through its milk trucks has successfully passed a several months' trial at Model Farms Dairy, Washington, D. C.

Now there is news that Seabrook Farms is taking an increased interest in the project, after having cooperated in its development from the early stages. Robert A. Saltzstein, Washington consultant, who worked out the program with Model Farms president P. O. Digges, is developing further marketing aspects under Seabrook's aegis.

Model Farms began selling frozen foods on an experimental basis, using only one route. Certain basic practices have been adhered to, all based on the idea that the frozen foods were designed to: (1) Sell more milk to old customers, (2) build customer volume, and (3) get new customers.

For one thing, sales are being made only on an order-in-advance basis; there is no door-to-door selling per se by the milk deliveryman. All orders are made over the telephone or by a simple weekly order blank, which the customer fills in and leaves for the driver to pick up.

Model Farms keeps a minimum stock

(News Continued)

Is yours a problem of
MIXING?
IF SO, let Sprout-Waldron be the first to come to your assistance.
Everyday we are matching customers' standard and specialized requirements for handling foods, dyes, plastics, chemicals—or what have you?
At Sprout-Waldron you will find a size, a type, and a construction for almost every mixing need.
There are verticals, horizontals, batch or continuous, rubber lined or glass lined . . . of wood, carbon steel, nickel steel, stainless steel—even Plexiglas.
Let's get together on your mixing problems today! Send full details to SPROUT, WALDRON & CO., 35 Waldron St., Muncy, Pa.
SPROUT WALDRON
Manufacturing Engineers
MUNCY PENNSYLVANIA
71

when you use

LETHALAIRE

No more laborious and messy hand-spraying . . . no more costly waste of materials . . . no more halfway results . . . no more insects!

Use this unique, scientific method of getting rid of insects . . . the Lethalaire method. A twist of the wrist releases a circulating mist that turns air into a death trap for insects. No need to spray behind objects, in corners or under baseboards. The precision-engineered nozzle makes certain every nook and cranny will be hit . . . releases the exact amount of insecticide needed to do a job. Lethalaire kills insects, from cockroaches to silverfish, does not contaminate food.

Lethalize with Lethalaire. See your supplier today . . . or mail the coupon for further interesting information.

VIRGINIA SMELTING COMPANY FI-3
WEST NORFOLK, VIRGINIA

Please tell me more about the Lethalaire method of controlling insects.

Name_____

Street_____

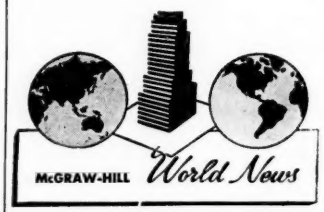
City_____

50 Years of Service to Industry

VIRGINIA Chemicals

WEST NORFOLK • BOSTON
NEW YORK • DETROIT

of frozen foods in its own plant. On the basis of orders phoned in or solicited by telephone from the plant, orders are filled each night by number assigned to the customer. In the morning, the delivery box is placed on the truck, the foods protected by dry ice. Driver drops off the order at each customer in sequence. If the housewife is not home, the order is stuffed into a jiffy-bag with a little dry ice; a message on the bag asks the housewife to save and return—which is done.



Dairies Develop Co-Op In Buenos Aires

BUENOS AIRES—The five largest pasteurizing and milk distribution companies serving the 3,000,000 population of Buenos Aires have decided to form a common corporation to pasteurize their milk.

This action resulted from a government ceiling on retail sales of milk that made operation uneconomical until a grant of 5 centavos (about 1c.) per liter of milk was given by the government to the milk distributors.

The margin of profit, however, is still slight and forced the five normally competitive concerns to combine in order to stay in the black. The price ceiling is 35 centavos per liter, unpasteurized, and 40 centavos per liter pasteurized (about 8c.).

Nearly all milk sold in Buenos Aires is pasteurized. It is distributed from door to door, since groceries are not permitted to sell milk.

South African Plant Refines Fish Oil

JOHANNESBURG—American know-how and South African enterprise have cooperated in the establishment of a fish oil refining plant using the Solexol process for the first time in the fishing industry anywhere in the world.

The process was developed by the M. W. Kellogg Co. of New York, and it is being used by the Marine Oil Refiners of Africa Ltd., at Simonstown, near Cape Town.

In this process, vitamin A concentrates are produced from crude fish liver oil. The plan can handle the Union's entire crude vitamin A oil production up to 12 trillion international units a year.

The company can also process pilchard oil. This is used as a linseed oil substitute because of its high degree of un-saturation, and it is also employed in the manufacture of linoleum, varnish, waterproof cloths, patent leather, putty, sulphonated oils and printing inks.

This latter plant was designed by the company's own technicians. A hydrogenation plant is to be installed to harden other refined marine oils into fats for edible oils, soap, margarine and shortenings.

Marine Oil Refiners of Africa Ltd. also obtained its plant in the United States and the sole license for Southern Africa. Its Solexol plant was process engineered and designed as an individual problem based on tests in New York on marine oils from South Africa.

In the process, refining tactics from the petroleum industry have been analyzed and applied to the food industry to handle fats and oils. It is mainly the application to foods of the cold fractionation prineiple.

Truck Trains Haul Cattle Over Aussie Stretches

MELBOURNE—While federal and state administrations are debating the construction of this and that railroad in Australia's "outback," cattle ranchers are fast going ahead with their own "railroad" plans (photo on page 144).

"Road trains" for transport of livestock are operating over hundreds of miles in Australia's sprawling Northern Territory, in Queensland, and in parts of other states that have been bypassed by the continent's railway system.

In the cattle trade there is a big difference between the ex-ranch value and the slaughter value of the stock on delivery. By the orthodox method of "droving" the cattle over sun-scorched country to the next rail head or meat works, an appreciable percentage of meat is lost after careful fattening on the ranch.

Rail transport, where available, cuts these losses, even though freight must be paid. But where no rail transport is handy, the road train has become the answer. Several road-train services have been sponsored by the British Food Mission.

A typical road train is operated by Kurt Johansen, Alice Springs. It was built by McGrath Trailer Equipment Pty, Ltd., Oakleigh, Victoria.

The train consists of a 200-hp. Diamond T Diesel truck with two 45-ft. 8-wheel trailers, with provision for an additional 36-ft. trailer. Approxi-

mate length of the whole assembly is 180 ft. It has 58 tires.

All trailer bogies are interlocked to steer and track with the traction unit. The train has sufficient capacity to carry 90 head of cattle or 60 tons of wool.

This particular train operates in the Northern Territory, between Alice Springs and Newcastle Waters—a round trip of 1,080 miles over relatively smooth military road. It averages 20 mph., at a fuel consumption of 4 miles per Imperial gallon. Fully loaded, the one-way trip takes two days.

Two drivers are employed per train, an appreciable saving over employment of two "drovers" who must spend weeks on horseback to deliver the cattle and get back to their ranches.

Canadian Oleo

OTTAWA, CAN.—The Canadian dairy industry's demand that the coloring of margarine should be conspicuous so that it would not be mistaken for butter is meeting with strong opposition from Canadian food makers. They insist that the Canadian government has no legal right to impose any such restriction.

Officials seem to agree that the Canadian government cannot provide any coloring restrictions, unless the process of coloring offers a violation of the Pure Foods & Drugs Act of Canada. The margarine makers charge that no such violation is involved in

(News Continued)

Wide World

Red Reclamation Plan

Tree shelter belts are springing up in Russia as part of a 15-year land reclamation and development plan. Eight forest belts, extending more than 3,000 miles, are to be planted. Other conservation measures will include the building of reservoirs and artificial ponds.

there's an easier way

there's also an easier way to clean your equipment

OAKITE 1909 1949 40th ANNIVERSARY YEAR

Figuring out easy ways to speed-up sanitation in food plants is something Oakite has been doing successfully for fully forty years. Here's how we go about it:

Into your plant, at your request, comes your local Oakite Technical Service Representative. One of the first things he does is to check your water condition. Then he examines nature of soils to be removed. Checks your equipment for presence of water-line scale, slime, rust. Notes the various types of metals to be cleaned. With these vital facts in his possession, he prescribes a set of alkaline and acidic compounds that will exactly suit your particular needs.

Tailored-to-fit cleaning materials plus scientifically designed mechanical cleaning equipment are essential for fast, easy, economical plant sanitation. Here's why! A man in New York may need Oakite Composition No. 63 to clean a blancher, while a man in Texas may need Oakite Compound No. 32, and a California customer gets best results with Oakite Compound No. 84M to clean the same kind of unit. That's why things like water hardness, the kind of soil, sensitivity of the underlying surfaces, design of your equipment come in for so much attention by the Oakite Technical Service Representative. That's why Oakite offers over 80 materials specially designed to fit every condition.

Now, if you would like to have a recommendation on one or a hundred cleaning jobs, give us a call (or send coupon below) and we'll go to work on them at no cost to you. On the other hand, you might like to have the helpful literature listed below. No cost—just check your preference.

MAIL COUPON NOW

Oakite Products, Inc.,
26G Thames St., New York 6, N. Y.

Have Representative demonstrate. ☐
Please send free literature about

☐ descaling
☐ deodorization
☐ conveyor maintenance
☐ sterilization
☐ steam cleaning
☐ bottle and jar washing

Name.....
Address.....
.....

OAKITE

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

Automatic JUICE LINES

Insure Uniform Quality Production at a Lower Labor Cost

The CRCO method of processing tomato juice produces an excellence equaled by no other method. It insures retention of full color and flavor with exceptionclly low operating costs—all bringing higher profits to the processor.

The CRCO High-Temperature Heat Exchanging Unit will pre-heat, cook and cool tomato juice to filling temperature in a continuous operation, thus eliminating the labor and equipment formerly employed in the retort method.

Economical in the use of steam because it recovers the heat from the cooking operation and uses it to preheat the product. Equipped with automatic steam and temperature controls.

Other outstanding CRCO Juice Equipment includes Washers, Chopper-Pumps, Extractors, Citrus Juice Finishers, Holding Tanks and a complete range of the famous CRCO-Ayars Fillers for every purpose.

Send for complete details, flow charts and specifications for Tomato Juice installations in existing or new plants.

THE BEST OF Everything

CHISHOLM-RYDER CO. INC.
Niagara Falls, New York
FOR THE FOOD PROCESSOR

Chisholm-Ryder Company of Pennsylvania
AN AFFILIATE

Ayars Machine Company
A Subsidiary

making margarine any color, even yellow or similar to butter. If the Canadian government insists on a coloring regulation, margarine makers are said to be ready to take the matter to court as a test case.

South African Fish

AMSTERDAM—A large Dutch combine is going to fish in South African waters and establish a fish oil, fish flour and conserved fish factory in South Africa. A site has been obtained at Saldanha Bay, near Cape Town, and modern American machinery has been ordered. Name of the S.A. company is Southern Sea Fishing Enterprises (Pty.) Ltd. and the capital issued is £230,000 ($920,000), mostly in Dutch hands.

Schedule of Events

March

6–10—National Preserves Association, annual convention, Stevens Hotel, Chicago.
7–10—National Association of Frozen Food Producers, annual convention and all industry exposition, Stevens Hotel, Chicago.
7–10—American Society of Bakery Engineers, silver anniversary meeting, Edgewater Beach Hotel, Chicago.
7–12—State College of Washington, 18th annual institute of dairying, Pullman, Wash.
15–17—University of Illinois, 1st annual conference for dairy and food technologists and sanitarians, Galesburg, Ill.
17–18—Mayonnaise and Salad Dressing Manufacturers Association, annual convention, Edgewater Beach Hotel, Chicago.
20–24—National Food Brokers Association, 44th annual convention, Chicago.
22–23—University of Wisconsin, annual dairy manufacturers conference, Department of Dairy Industry, Madison, Wis.

April

10–14—American Society of Brewing Chemists, annual meeting, Roosevelt Hotel, New Orleans, La.
27–30—National Fisheries Institute, 4th annual convention, Edgewater Beach Hotel, Chicago.

May

1– 4—Southern Bakers Association, 35th annual convention, Peabody, Hotel, Memphis, Tenn.
2– 5—U. S. Brewers Foundation, 73d annual convention, Waldorf-Astoria Hotel, New York City.
9–11—Millers National Federation, annual convention, Edgewater Beach Hotel, Chicago.
10–13—American Management Association, 18th annual national packaging exposition, Convention Hall, Atlantic City, N. J.
15–19—American Association of Cereal Chemists, 34th annual convention, Hotel Statler, New York City.
20–28—National Pickle Week.

30-June 1

U. S. Wholesale Grocers Association, annual convention and exposition, Auditorium, St. Louis, Mo.

What makes the NEW FIRMENICH FLAVORS UNIQUE?

RASPBERRY

PINEAPPLE

BLOOD ORANGE

GRAPE

GREEN GAGE PLUM

MAPLE

CHERRY

APRICOT

BANANA

BUTTERSCOTCH

CARAMEL

1 ACCURACY. Absolute, authoritative accuracy in duplicating the flavor of fresh fruits has never before been possible. These new materials achieve it. Since the turn of the century the advanced Chuit-Naef laboratories in Geneva have been engaged in research on the organic chemistry of natural compounds. Some of the outstanding chemists of the world have taken part; over the years hundreds of original discoveries have been made. The present flavors are the end product of this work. Their scientific precision is based on exact knowledge.

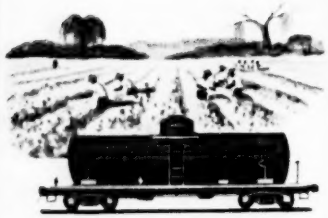
2 PURITY. All Firmenich products are made in controlled quantities, under continuous supervision. There is no other way to obtain the purity, uniformity and high stability of these new materials. (Like all superior synthetics they are gratifyingly predictable in storage and in mixing because from the very start components not contributing to flavor or odor are simply not present.)

3 CONCENTRATION. Almost all flavors are available in "A" concentration. At this strength they are usually used in a ratio of about **one part to ten thousand** by weight. The many practical applications of such highly concentrated materials suggest themselves at once.

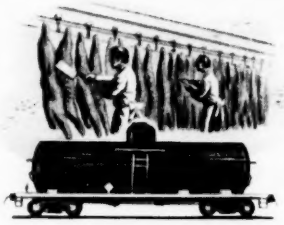
For samples write to: **Dept. A, FIRMENICH & CO.** 250 WEST 18 STREET, NEW YORK 11, N. Y.

FIRMENICH & CIE.
SUCCESSEURS DE
CHUIT, NAEF & CIE.
GENÈVE SUISSE

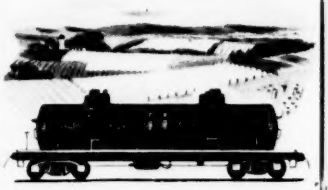
CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE
IN CANADA: CARAMEED, LTD., 350 WALLACE AVENUE, TORONTO
GENEVA, SWITZERLAND . . . PARIS, FRANCE



COTTONSEED OIL

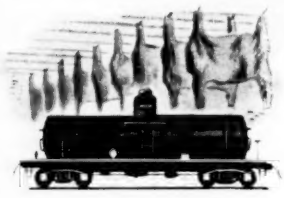


LARD



LINSEED OIL

for bulk liquid shippers
GATX Tank Cars
offer safe, economical transportation



TANNIC ACID

DESIGNED, BUILT
OPERATED and
MAINTAINED by

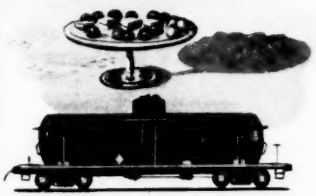
GENERAL AMERICAN
TRANSPORTATION CORPORATION

135 South LaSalle Street Chicago 90, Ill.

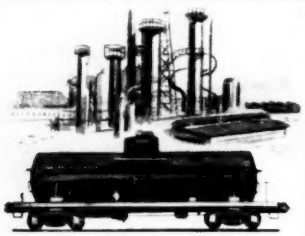
District Offices: Buffalo • Cleveland • Dallas • Houston
Los Angeles • New Orleans • New York • Pittsburgh
St. Louis • San Francisco • Seattle • Tulsa • Washington

Export Dept., 10 E. 49th St., New York 17, New York

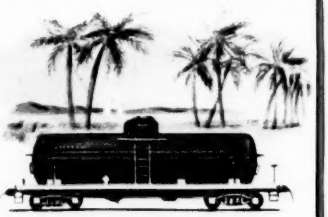
GATX GENERAL AMERICAN TRADE MARK



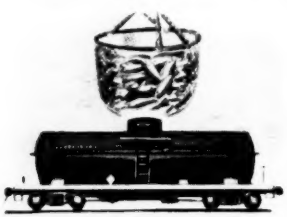
CORN SYRUP UNMIXED



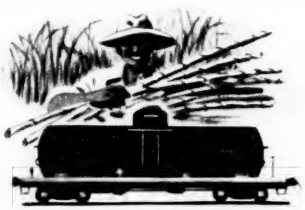
CORN OIL



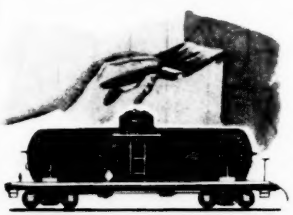
COCONUT OIL



FISH OIL



MOLASSES



TUNG OIL

Changes in Food Supplies

Materials

CHICKS produced by commercial hatcheries during December was the largest on record for that month. Output totaled 54,713,000, 63 percent higher than December 1947 production and 58 percent above the five-year December average. A much larger January hatch than was produced the previous year also is estimated.

OLIVE production in California, in 1948, is estimated at 62,000 tons, about 50 percent higher than the 1947 crop. The olives failed to size, however, due to cold weather, hence the output is practically useless for processing.

Production

CREAMERY BUTTER production in December, estimated at 83,670,000 lb., was 9 percent larger than the December 1947, output, but was 9 percent under 1942-1946 average for the month. The November-December increase was 6 percent, compared with 10 percent in 1947 and an average of 5 percent for the five-year period.

ICE CREAM output in December was estimated at 31,730,000 gal., a 2 percent gain over December 1947 production, and 14 percent more than the five-year average for the month. Output declined 9 percent from November, which compares with only a 4 percent November-December drop in 1947. The five-year average seasonal decrease for December, however, was 18 percent.

AMERICAN CHEESE production, estimated at 54,455,000 lb. in December, increased 7 percent from November—the first time December production showed a gain over November since 1943. In 1947 there was a 4 percent decline between these two months, while the five-year average shows a 2 percent drop. December production was also 31 percent greater than during December 1947, and was 23 percent higher than the recent five-year average for the month.

TOMATO JUICE canned in 1948 amounted to 23,701,199 actual cases, according to the estimates of the National Canners Association. Except for the 1947 pack or 16,880,277 actual cases, this was the smallest recorded during the past four years.

Stocks and Storage

FROZEN FISH AND SHELLFISH, held on January 1, totaled 152,373,784 lb., which compares with 133,843,860 lb. held Jan. 1, 1948.

CONSTRUCTION

	Total Awarded		
	Pending (thousands)	Feb. (thousands)	1949 (thousands)
Bakery	$538	.....	$143
Beverages	711	.....	2,423
Canning and preserving	.....	$115	115
Cold storage	.....	.....	775
Confectionery	70	250	550
Grain mill products	375	375	375
Ice, manufactured	.....	.....	.....
Meats and meat products	468	.....	255
Milk products	75	300	557
Miscellaneous	1,685	150	1,548
	$3,922	$1,190	$6,744

FOURTEEN CANNED COMMODITIES—Stocks in hands of wholesale distributors and retail food chain warehouses, as recently reported by the Department of Commerce.

Commodity	Thousands of Actual Cases: January 1 1949*	January 1 1948	January 1 1947	Average January 1 1943-1945
Total of 14 commodities	*44,062*	*53,211*	*63,615*	*39,312*
Four vegetables, total	*24,210*	*30,422*	*36,439*	*25,445*
Beans, green and wax	3,362	3,777	6,493	5,216
Corn	7,851	9,337	9,947	6,873
Peas	7,328	9,775	13,590	6,010
Tomatoes	5,669	7,533	6,409	7,346
Five fruits, total	*10,984*	*13,337*	*11,070*	*5,126*
Apricots	1,250	1,770	2,603	747
Mixed fruits	2,086	2,478	1,357	946
Peaches	4,960	6,697	5,434	2,074
Pears	898	1,485	922	429
Pineapple	1,790	907	854	930
Five juices, total	*7,868*	*9,452*	*16,105*	*8,741*
Tomato	3,248	4,886	8,917	5,103
Grapefruit	1,247	1,787	3,144	2,223
Orange	1,355	1,405	2,242	.....
Blended citrus	692	709	1,291	941
Pineapple	1,326	665	511	474

* Preliminary

A Thrifty Mixer

FOR CHEMICALS, FOODS and OTHER LIQUID MATERIALS

You'll save time and money by using Eastern mixers in your laboratory and production processes. Whether used in experimental or run-of-the-mill applications, Eastern mixers blend and mix economically over long periods of service. Every Eastern mixer is factory pre-tested for precision and performance. All are guaranteed by the manufacturer.

MODEL H-1 Heavy duty 1 4 H.P. High speed—1725 R.P.M. 30" shaft dual 4" low pitch props.

Available in models from 1 20 to 5 H.P. Motors are sleeve-bearing; totally or semi-enclosed or explosion-proof. Screw clamp or bracket mounting. Stainless steel shaft; nickel plated bronze props. Easy to clean, dependable and maintenance-free.

WRITE FOR FULL DETAILS

Eastern INDUSTRIES, INC.
18 REGENT STREET
East Norwalk, Conn.

CLEAN UP
WITH
KLENZADE
DETERGENTS
AND
SANITATION
CHEMICALS

KLEER-MOR
Popular wetting agent detergent for all hand cleaning jobs in the food industries. Rapid detergent and emulsifying action.

KLENZADE X-4
Concentrated powerful liquid-type sodium hypochlorite disinfectant and germicide. Ideal for food plants. Leaves no film.

STER-KLEEN
Organic acid detergent compatible with all quaternaries. Removes lime film and alkaline deposits from equipment.

STER-BAC
An outstandingly powerful quaternary for sanitizing food plant equipment and preventing mold growth.

Offices in Principal Cities
A Klenzade field technician will gladly call and help you plan a complete plant and equipment cleaning program.

KLENZADE PRODUCTS, Inc.
BELOIT, WISCONSIN

What Washington Thinks

By R. S. McBride, Washington, D. C.

REORGANIZATION

Herbert Hoover and Harry Truman have become buddies in the effort to get reorganization of the executive departments. If Congress grants authority for Presidential ordering of changes, look for some very radical reorganization in the bureaus and agencies of importance to food. At the beginning of February, it was very uncertain how far Congress would go in granting executive authority, most of the caution coming from the legislators' desires to protect "sacred cows."

RESEARCH FOUNDATION

The President put $2,000,000,000 into the budget for the next fiscal year on the assumption that the National Science Foundation would be established this spring and could begin spending soon. Maybe it will. Major question is whether the new money could go for research at all soon. Much more likely, it seems, is a plan for early spending on scholarships and fellowships. These latter will be encouraged by the educators, who look anxiously about for something to replace the GI educational spending on the campuses of America.

FOOD STAMPS AGAIN

Secretary of Agriculture Brannan would like renewed authority to experiment with a food stamp program. Since Brannan has high standing in the "Truman Deal" organization, he may get it. If granted, food stamps will be used both to improve the diet of low income groups and to secure quicker distribution for foods in surplus. As initially asked, the food stamp plan is not merely a philosophy of the "do-gooders." No one knows what it might become if Congress writes a blank check.

BETTER CHEESE

Improved brick cheese is the goal of government-aided research. One of the major objectives is to restore the popularity of this cheese, which has apparently been falling in public favor. In announcing the new program of the Bureau of Dairy Industry in cooperation with the Wisconsin Agricultural Experiment Station, the Department of Agriculture implies that the decline in favor was in some measure the result of decreased uniformity in flavor and texture of this type of cheese. It is hoped that new methods of control may be developed to give a product on which the public can depend for palatability and appearance. In any event, detailed studies are promised of both bacteriological and chemical changes which occur during manufacture and cure.

WORLD FOOD SUPPLY

The Global supply of food, as currently forecast for major commodities of international interest, is now approximately equal to the prewar five-year average of 1935 to 1939. This is good news. But it means also that foreign demand for American manufactured food, as well as for food grains and other raw materials, will shrink from now on.

UNDER-PASTEURIZED?

Some time ago, the Department of Agriculture specialists announced a new type of test for detection of under-pasteurization in the products made from milk not adequately treated at the pasteurizer. Lately, this technic is again being publicized. The effort is to get wider use in the dairy plant so that the products made will have a maximum of quality with respect to both shelf life and dietetic safety. The industry should not be surprised if it hears quite a bit more about the "BQC" test. The name comes from the active reagent used in the final test—*di-bromo quinone chloroimine.*

SCIENCE IS TOO GOOD!

Washington is quite conspicuously blaming science for some of the new farm-surplus problems. Fortunately, there seems to be little desire to curb scientific effort. But even important government officials are pointing out, with increasing frequency, the threat to farm profits that is coming from better hybrids, superior cultivation, more fertilizer, weed killers, and the overall resulting increase in yield per acre and per man.

PRICING IN CENTS PER POUND

Most readers of FOOD INDUSTRIES are familiar with the system of pricing potatoes per bushel or per hundredweight. Apparently, we will now have to get acquainted with a new form of potato pricing—cents per pound. Lately, government statistics are being given in this measure because the market price is now commonly in

the neighborhood of five cents per pound—from two to three times what it was a decade ago. Fortunately, spuds are not yet quoted in dollars per caret like gems. Seriously, though, these abnormal units, as considered from an old-fashioned point of view, have an important meaning as one considers the inter-commodity competition of potatoes with flour and bread and other starch supplies in the diet.

LABOR LAW

Congress is committed to drafting new labor legislation. For sake of political appearance, the Taft-Hartley Law will disappear, at least as far as name is concerned. But no thoughtful Washington observer expects that all the benefits of that law are going to be thrown overboard. It is a safe forecast—perhaps the only safe one—that Congress is going to stop somewhere between the old Wagner Act and the recent Taft-Hartley Law. But the new bill, when passed, will be embroidered with a number of new designs prepared in CIO and AFL headquarters.

ANY "WISE OWLS"?

In its general desire to encourage safety proceedings, Washington executives have been noting with interest the growth of the "Wise Owl Clubs." These organizations are established by railroads, industrial companies, and others, in recognition of safety precautions which have saved the sight of some one's eyes. To be a member, one must have had his eye sight protected during an accident by goggles or other safeguard. It is something like the airmen's Caterpillar Club made up of those who have saved their lives by parachuting. Of course, the basic idea is that recognition of this sort does much to encourage carefulness.

WHY IT IS BETTER

For some time it has been recognized that bactericidal control with chlorine dioxide is in many cases more complete than by chlorine. The advantages of the oxide are particularly noted in cases where bactericidal action is desired in the presence of much organic matter. Free chlorine reacts so vigorously with most organic materials that it is not as persistent as is chlorine dioxide. And the oxide is also much more effective in alkaline solution, which merely tends to neutralize the free chlorine. All of this suggests the advantage, under many food factory conditions, of considering control of bacterial contamination by use of the dioxide, either alone or in association with chlorine.

Self-Cleaning

DAY

AIR-LIFT ELEVATORS

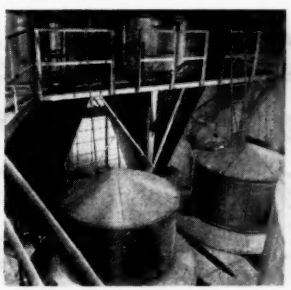
Eliminate Cleaning Between Batches!

DAY Air Lift Elevators offer food processors cleaner, more efficient and flexible bulk material handling with lower maintenance costs. **DAY** pneumatic conveying systems are designed for processes requiring conveyance of loose, dry, bulk materials. The **DAY** Company has facilities for engineering and manufacturing complete pneumatic conveying systems including fans, DUAL-CLONE dust separators and automatic-continuous dust filters.

A typical **DAY** Air Lift Elevator operation is illustrated above. This system saves the expense of cleaning elevator boots and buckets between batches, and allows more efficient handling of bulk materials. The flexibility of **DAY** pneumatic conveying systems permits material to be easily transported around obstructions. Conveying lines are on positive suction to eliminate dust as materials are moved.

This **DAY** installation uses a 15 HP motor to elevate 10,000 pounds of material per hour. The **DAY** exhaust fan shown in the doorway sucks material and air up through the pipe (farthest right) into a **DAY** DUAL-CLONE separator. Material is then trapped out at the DUAL-CLONE into a turnhead for spouting into any of ten hoppers.

NO MATERIAL GOES THROUGH THE FAN.



Complete dehydrating system fabricated and installed by one supplier. **DAY** Company fabricates stainless steel up to 10 gauge for any branch of the food industry.

DAY engineers have specialized in air engineering for the food, seed and grain industries since 1881. For engineering assistance and cost estimates, *Write-to-***DAY**.

The **DAY** *Company*

817 Third Avenue N. E. • Minneapolis 13, Minnesota

IN CANADA: P. O. Box 70D, Ft. William, Ontario, Canada

Branch plants in Fort Worth, Buffalo and Welland, Ont.

Which has Longer Keeping Qualities?

The Answer is one of 11 reasons Why You Should Use

MM&R SPICE OILS, the MODERN Method of FLAVOR CONTROL

Leading food packers have *proved through use* that products have better keeping qualities . . . stay brighter-colored, cleaner-looking longer, when MM&R Spice Essential Oils are used to replace crude spices.

MM&R Spice Essential Oils, in glass or cans, can never become contaminated — can never introduce spoilage-causing foreign materials into your food products.

Think it over! And consider, too, the eleven other sound reasons for using MM&R Spice Oils. Then discover for yourself why each year finds more and more food producers switching from old-fashioned flavoring methods to the *modern* flavor control afforded by MM&R Spice Essential Oils.

1. Uniformity of quality and flavoring
2. No color disturbance
3. Less bulk in storage
4. Less weight in shipping
5. No danger of molding
6. No loss by exposure in package while being stored
7. No starch introduced into your product
8. Ease of handling
9. Less cost as compared to equivalent spice value
10. Entire flavor available immediately
11. Elimination of the possibility of dust and dirt

Send for "Table of Equivalents" Showing Comparative Flavoring Strengths of Whole Spices and Spice Oils

MAGNUS, MABEE & REYNARD, INC.

SINCE 1895 . . . ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS

16 DESBROSSES STREET, NEW YORK 13, N. Y. • 221 NORTH LASALLE STREET, CHICAGO 1, ILL.

Los Angeles: Braun Corp. • Seattle, Portland, Spokane, Van Waters and Rogers, Inc. • San Francisco: Braun-Knecht-Heimann Co.

Men, Jobs, Companies

DR. E. L. HOLMES, sanitation director, American Institute of Baking, was named by APHA to committee on food industry sanitation practices. (Fabian Bachrach photo)

HUGO SLOTKIN newly elected president of Hygrade Food Products Corp., New York City. He succeeds his father, founder of the firm, who continues as chairman of board.

F. W. SPECHT, president of Armour & Company, was recently elected board chairman and chief executive officer to succeed G. A. Eastwood, who resigned after 52 yr. of service.

HUGH McDONALD, supervisor of milling operations with Pillsbury Mills, Inc., retired Jan. 1 after 43 yr. with company. He is a graduate of U. of Minn. and Dunwoody Institute.

Industry

ADAMS PACKING ASSN. has started construction of a frozen citrus concentrate unit at Auburndale, Fla., estimated to cost about $750,000. Plant will have annual capacity of 1,000,000 boxes. Entire output has been contracted by Snow Crop Marketers, Inc.

F. E. BOOTH CO., INC. is reported to be increasing production facilities at its Centerville, Calif., plant in preparation for the 1949 canning season.

CAMPBELL SOUP CO., Chicago, has expanded its program of bacteriological research and production control. C. L. Mohs and M. K. Smith, both from the Department of Agricultural Bacteriology, U. of Wisconsin, have been added to staff.

CHASE CANDY CO. has discontinued manufacturing operations in its St. Joseph, Mo., plant. Key personnel and equipment have been transferred to the St. Louis, Mo., and San Jose, Calif., plants.

CANADA DRY GINGER ALE, LTD., Toronto, is reported to be buying land in Halifax, N. S., for construction of a new plant.

CORN CANNERS' SERVICE BUREAU has announced election of the following officers to serve during 1949: President, E. H. Dunlap of Plymouth, Ind., Canning Co.; first vice-president, G. A. Borg, Northland Canning Co., Cokato, Minn.; second vice-president, Parker Mitchell, Jr., of F. O. Mitchell & Brother, Inc., Perryman, Md.; and secretary, R. E. Schlecht, Rossville Packing Co., Rossville, Ill.

LOOKOUT OIL & REFINING CO. of Chattanooga, Tenn., a subsidiary of Armour & Company, is reported to be ready for operations in its new oleo plant, constructed at a cost of $350,000.

MORTON SALT CO. is converting a large warehouse in Grand Saline, Tex., into a dairy mill to replace the one destroyed by fire last October.

OSCAR MAYER & CO. has acquired the meat packing plant of Fred G. Vogt & Sons in Philadelphia. The Mayer firm also recently purchased the packing plant in Davenport, Iowa, which it had been operating for two years under lease with Kohrs Cold Storage Co.

OMAR BAKING CO. has obtained a site near Chillicothe, Ohio, to build a new branch plant. Cost of the structure is estimated at $150,000. Construction is in line with the national expansion of the firm.

CHAS. PFIZER & CO., INC., Brooklyn, N. Y., announces a sales organization expansion, including formation of a new industrial sales division and a medicinal chemicals and antibiotics sales division. Still another new division will handle sales in the food and beverage industry.

RIECK-MCJUNKIN DAIRY CO., Pittsburgh, Pa., is planning a $1,000,000 ice cream plant in the Homestead area.

STANDARD BRANDS, INC., has opened a new egg-breaking plant at Lexington, N. C., adjacent to the David Frozen Foods plant.

VACUUM FOODS CORP., Plymouth, Fla., is reported taking over the Ploeger-Abbot Co. in Leesburg, with plans to convert it to citrus concentrate manufacture.

VERNOR'S GINGER ALE BOTTLING CORP. of Boston announces purchase from Corn Products Refining Co. of Dr. Swett's Bottling Co. of the same city. The latter firm is one of the country's oldest, having been established in Natick, Mass., in 1845.

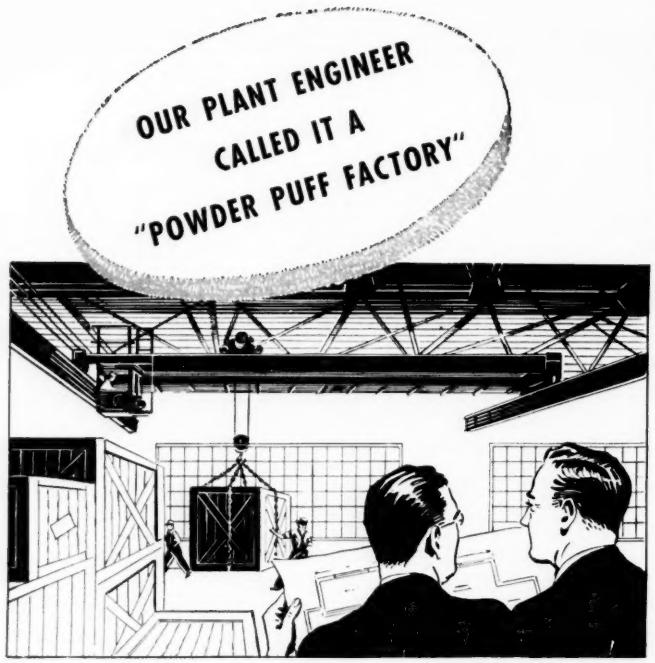
STELLA CHEESE CO., Madison, Wis., a leading Italian cheese producer, is reported to have been purchased by a group of Chicago and Wisconsin capitalists.

Personnel

N. M. ADAMS, formerly in charge of by-products research with Wilson & Co., Chicago, recently resigned to form his own business.

H. E. BRUCE, formerly with the W. J. Howe Co., has been appointed southeastern division manager for Vacuum

(Continued)



"We liked the location and the size, but when we figured on increasing crane capacity, the structure just wouldn't take it. Our plant man finally gave up in disgust saying, 'They must have built this shop for a powder puff factory.'"

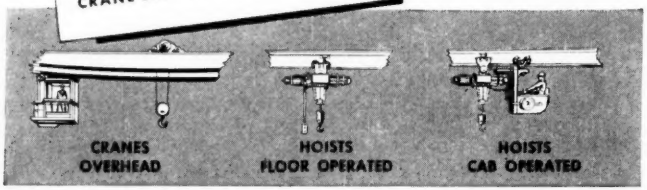
"When we decided to build, you can bet we planned *in advance* against the possibility of a future need for greater crane capacity."

"The Shepard Niles specialist was a great help in this planning. He seemed to know just about what loads were maximum in different types of industry. We were guided, to a great extent, by his suggestions."

The time to plan for most economical materials handling is before the building is built or the remodeling completed. Ask the Shepard Niles specialist to sit in—he has lots of experience behind him—and his sales interest is not concentrated on any one type of lifting tool.

SHEPARD NILES
CRANE AND HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads.



422 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

GEORGE RENEAU, manager of Trenton branch of Stokely-Van Camp, Inc., has been transferred to the home plant in Indianapolis to become general operations manager. He will be succeeded by Norman Bauer.

Foods Corp. with headquarters in Atlanta.

C. K. CROCKER, formerly with Oscar Mayer Meat Packing Co., Chicago, is now in charge of bacteriology research division of the Diversey Corp., Chicago.

ARTHUR FORNET, a prewar department chief in the Reich's Government Research Institute, Berlin, and more recently attached to QF&CI for the Armed Forces, Chicago, is now a member of the research staff of W. E. Long Co., Chicago.

FRANK GLEN, former factory manager of Queen Anne Candy Co., Hammond, Ind., is now general superintendent of Riggi Candy Co., Chicago. His successor at Queen Anne is Bert E. Torr, who has been with Chase Candy Co. as assistant production manager of its National Candy division in St. Louis.

E. H. HARVEY, past president of IFT, has been awarded the Presidents' Certificate of Appreciation for his outstanding contributions to the Office of Scientific Research & Development during World War II.

FRED C. HEINZ, newly-elected director of the National Canners' Assn., who has been correlating the Association's building program drive, has appointed a Pacific Coast sub-committee composed of Emil Rutz, R. G. Lucks, L. J. Taylor, and R. C. Paulus.

EARL D. MALLISON, director of research and development for the Atlantic Commission Co., produce-buying affiliate

(Continued)

Would you be in this line-up?

If executives who have suffered losses because of package and contents damaged in transit could recoup them at a window like this, the line would extend around and around the block.

But it would be hard to find a single man in line who packed his product in metal containers.

Cans protect.

AMERICAN CAN COMPANY

New York • Chicago • San Francisco

This trademark CANCO *is your assurance of quality containers. Look for it!*

Other advantages of the can

1. **Cans are break-proof.**
2. **Cans protect contents against light, air, insects, and moisture.**
3. **Cans are *light*—mean lower shipping costs. *Compact*—mean more storage and display space.**
4. **Cans mean eye-appeal for impulse buying.**
5. **Cans are tamper-proof.**
6. **Cans are easy to open and dispose of.**

MOREHOUSE
SPEEDLINE
MODEL SS20
(STAINLESS STEEL)

Big Volume
Many times the production of ordinary equipment. Versatile and easily cleaned.

Small Size
Model SS20 requires space of only 20" diameter, and 60" height. Easily set up or moved — no special base required.

High Quality
Uniformity and fineness of grind positively controlled. Adjustable without stopping.

. . . at less cost!

For years food manufacturers have been looking for a better way of processing many types of food products—fruits, vegetables, grains, meats. Sauces too, and spices and condiments. Now the famous Morehouse grinding principle, used in industrial fields throughout the world for the past 15 years has been adapted to food processing needs.
It's more efficient, faster and better. Fine engineering and high quality materials assure dependability and economy. It's versatile, too—ideal for many products. There's a model to meet your needs—write for full details today.

MANUFACTURED AND SOLD ONLY BY
MOREHOUSE INDUSTRIES
Originators and sole manufacturers of Morehouse Speedline Equipment
Factory and Western Sales Office: 1156 San Fernando Road, Los Angeles 31, California
Eastern Sales Office: 705 Henry Grady Building, Atlanta 3, Georgia, Phone MAin 4469
Export Office: 616 Parkway Building, Pasadena, California
Cable Address: Wecoman, Pasadena

of A&P food stores, has made a special study of food transportation and storage problems in Europe. His survey made upon ECA request, covered all countries coming under the recovery program.

H. B. MANNING has been appointed president, and H. S. Conrad vice-president of Weston Bakeries, Ltd.—a newly organized subsidiary of George Weston, Ltd., Montreal, Quebec.

ROBERT E. QUINLAN, formerly with W. E. Long Co., Chicago, has been added to the field merchandising staff of the Bakers of America Program.

JOHN RIEGER has been appointed vice-president of the Pepsi-Cola Metropolitan Bottling Co., New York City. He will be in charge of all company owned bottling plant operations in the U. S. . . Other recent appointments include E. A. LeRoy as vice-president and H. L. Barnet as assistant vice-president of the parent company.

JOHN R. RHAMSTINE, formerly manager of Corn Products Refining Co.'s Pekin, Ill., plant and more recently asistant to the president, has been appointed a director of the firm.

W. J. ROEHL has been named vice-president of National Selected Products, Inc., and of 6-O'Clock Foods, Inc.

ARTHUR SHAVER has been elected a vice-president of Standard Brands and will be in charge of the Fleischmann and Chase & Sanborn manufacturing divisions.

RAYMOND STOIBER, formerly of the Kingsbury Breweries, Sheboygan, Wis., has been appointed assistant brewmaster for the West Bend Lithia Co., West Bend, Wis.

VE NONA SWARTZ, formerly home economist with the American Meat Institute Foundation, recently became a technologist for the Food Acceptance Branch, QF&CI for the Armed Forces, Chicago.

FRED W. TANNER, JR. formerly in the fermentation div. of the Northern Regional Research Laboratory, Peoria, Ill., is now with Chas. Pfizer & Co., Inc., Brooklyn, N. Y.

LEONARD R. TRAINER has been appointed director of the Food Distribution Programs Branch of the Production & Marketing Administration, USDA.

(Continued)

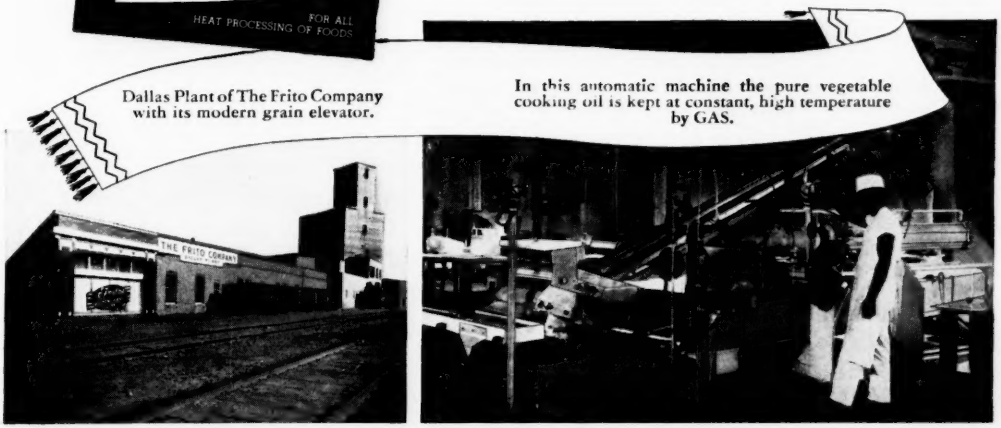
Continuous Cooking Operations of THE FRITO COMPANY *Emphasize Speed and Controllability of* GAS

CONTINUOUS PRODUCTION is the one way The Frito Company can cope with the coast-to-coast demand for the popular "golden chips of corn" called FRITOS. Automatic machines press out the ribbons of ground corn and then the all-important cooking cycle is left to GAS and the modern Gas Cooking Vat with its automatic controls.

President C. E. Doolin, the founder of The Frito Company, in emphasizing the necessity for maintaining the pure vegetable cooking oil at absolutely constant high temperature, states, **"A great deal depends on this cooking process and GAS has been the answer since 1932 when we first began making FRITOS."**

Mr. Doolin's emphasis on constant, automatically-controlled temperatures is understandable. FRITOS are produced in 26 plants in the United States, as well as in Hawaii—wherever they are cooked they must have the color, texture, and taste-appeal which customers demand, and on which profits depend.

When selecting the fuel most applicable to the continuous machines for producing FRITOS, the executives of this food processing company had a background of experience with the cleanliness, speed, controllability, and versatility of GAS. You'll find it worthwhile to investigate these same characteristics of GAS for your own heat-processing requirements.

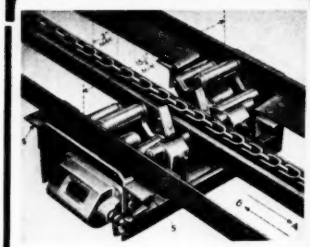


Dallas Plant of The Frito Company with its modern grain elevator.

In this automatic machine the pure vegetable cooking oil is kept at constant, high temperature by GAS.

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

STOP LOSING $$$
thru
SHORTAGES
and
OVERRUNS!

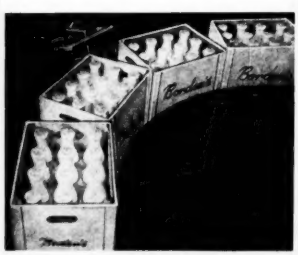


GET THE FACTS ABOUT
LEWIS
CASE *and* CAN
COUNTERS

— 100% accurate —
long life under hard usage

Proven by many years of excellent service, in leading dairies, ice cream plants, breweries, bottling plants, soap plants, food packing plants and other industries. Let our engineers solve your counter problems.

Write today for the Lewis Case Counter Catalog.



STEPHEN J. LEWIS
ENGINEERING COMPANY,
215 Butler St., Brooklyn 17, N. Y.

Associated Industry

BALL BROTHERS CO. has leased the Jacksonville, Fla., plant of Chattanooga Glass Co.

CHERRY-BURELL CORP., Chicago, announces appointment of John G. Cherry as vice-president in charge of production.

ELECTRIC STORAGE BATTERY CO. announces appointment of Robert L. Somerville as assistant general sales manager.

LYNCH CORP. has completed plans for consolidating all sales, engineering, and service of packaging machine lines under one roof at the Toledo plant.

PEERLESS PUMP DIVISION, Food Machinery & Chemical Corp., announces opening of a sales office in Omaha, Neb., with J. W. L. Stone as manager.

POLLOCK PAPER CORP. will establish a $150,000 laboratory for research and development in the food packaging field at its Middletown, Ohio, plant.

BEMIS BRO. BAG CO. has named H. L. Bayne as manager of its Kansas City plant to succeed Clyde F. Scott, who recently retired after 30 yr. service.

VENDOLATOR MFG. CO. of Fresno, Calif., has leased 10,000 sq. ft. of space at Piqua, Ohio, and plans to establish an eastern branch assembly plant.

PACKAGE MACHINERY CO. of East Longmeadow, Mass., announces election of George A. Mohlman as chairman of the board to take the place of Roger L. Putnam, who resigned that position to become president of the company.

Deaths

ADOLPH DIRIAN, 73, vice-president and brewmaster of Monarch Brewing Co., Chicago. Jan. 23 in Oak Park, Ill.

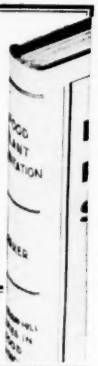
LESTER O. BARR, 70, former manager of various Swift & Co. plants. Jan. 22, in Tucson, Ariz.

F. W. FETTERMAN, 63, engineer with Libby, McNeill & Libby in San Francisco. Jan. 21 in Chicago, of a heart attack.

COL. ALBANUS PHILLIPS, 77, one of the founders of the Phillips Packing Co., Inc., of Cambridge, Md. Jan. 17 at his home.

Helpful books for the FOOD TECHNICIAN

Examine them 10 days free



1 FOOD PLANT SANITATION — By Milton E. Parker. Offers proven sanitation methods on everything from effective plant layout and design to the proper selection of packaging materials. Makes available to you practices in accordance with the Federal Food, Drug and Cosmetic Act. $6.00

2 FLAVOR — By C. E. Crocker. A source of reference information on every aspect of flavor and taste. Includes the chemistry of flavoring agents and condiments . . . methods of developing flavor in processed foods . . . methods for the detection, correction and prevention of undesirable flavor in commercial products. $3.00

3 Commercial Fruit and Vegetable Products — By W. V. Cruess. A thorough treatment of the application of scientific principles to the manufacturing and preserving processes. Covers important advances in canning, spoilage, frozen-pack foods, packaging, etc. New Third edition. $8.50

4 FOOD TECHNOLOGY — By S. C. Prescott and B. E. Proctor. This book discusses the manner in which foods are harvested, transported, manufactured and prepared for use; why certain processes are utilized and how the methods are practiced. $5.50

5 MILK and MILK PROCESSING — By B. L. Herrington. Gives the basic information necessary for work in the dairy industry and understanding of milk and milk products. Emphasizes the principles underlying the processing of milk and gives background material on biochemistry. $3.75

6 INDUSTRIAL MICRO-BIOLOGY — By S. C. Prescott and C. G. Dunn. Deals with the fundamentals of the utilization of yeasts, bacteria, and molds for the production of industrially important products . . . the organisms, their cultivation, end-products and biochemistry of fermentation. $6.00

Free Examination—Order by number

McGraw-Hill Book Co., 330 W. 42nd St., NYC 18

Send me book(s) corresponding to the numbers encircled below for ten days' examination on approval. In ten days I will remit cost of the books I keep, plus few cents delivery charges, and return unwanted books postpaid. We pay mailing costs if you send cash with this coupon. Same return privilege.

1 2 3 4 5 6

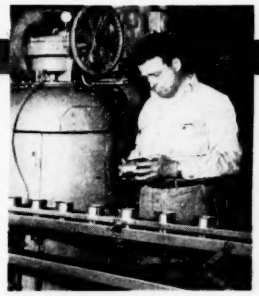
Name .....

Address .....

City ..... Zone..... State.....

Company .....

Position Food-3-49



count on

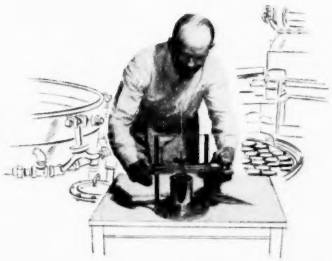
NATIONAL CAN

for container

SUPPLY...
SERVICE...
SUGGESTIONS

Seam Inspection by Double Seamer Serviceman.

During packing periods, National Can Double Seamer Servicemen protect against costly seamer breakdowns. They also provide on-the-spot repairs, or — when required — make complete overhauls in our thoroughly equipped central machine shops.



Center-can Temperature Testing by Field Technologist.

National Can Technical Service Division is staffed by technologists skilled in the processing of foods, backed by complete chemical and bacteriological laboratories. Through routine field tests or detailed laboratory analyses, this service can help boost and better your output.

When selecting a metal container supplier, consider the advantages you get by using National Can. *Dependability?* Close to fifty years of making deliveries where needed, when needed, despite supply conditions. *Service?* In the food field, an excellent Double Seamer Service; and the laboratory facilities of the Technical Service Division. In the general line, a complete lithography service, advising and assisting on container color, design, illustration, layout. *Suggestions?* Engineering know how accumulated through years of helping solve customers' problems and through unremitting research — on tap when you are planning plant layout, filling procedures, sanitary precautions, and other important considerations where reliable advice may be welcome.

Yes, when you call in National Can, you can count on *more* than the basic assurance of a dependable supply of containers. You have also a choice of available services — mechanical, technical, lithographic — swift, skilled, sure. And always at your disposal is our fund of production ideas, selectively gathered through the years, constantly re-examined, tested and renewed. You can easily investigate these factors to the full by telephoning your nearest National Can sales office or plant.

Containers Like These "Say It With Sales".

National Can helps you step up your product's selling power by a complete and closely cooperating lithography service — fully equipped to add to the customer assurance of product protection that only metal can create, the positive selling qualities of tested color combinations and distinctive design, layout and illustration.

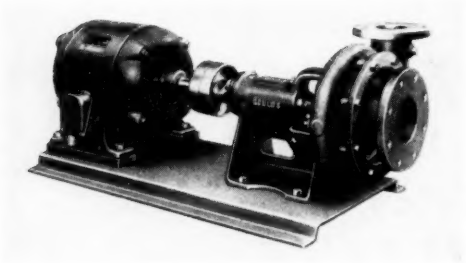
7282

NATIONAL CAN CORPORATION

Executive Offices: 110 EAST 42nd STREET, NEW YORK 17, N. Y.

Sales Offices and Plants: Baltimore, Md. • Indianapolis, Ind. • Chicago, Ill. • Maspeth, N. Y. • Hamilton, Ohio • Canonsburg, Pa. • Boston, Mass. • St. Louis, Mo.

Food Equipment News

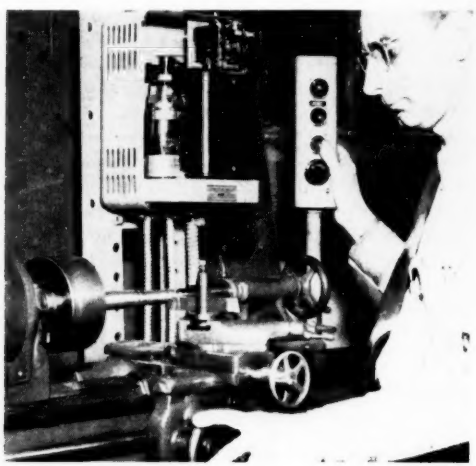


Centrifugal Pump 1

For clear liquids, general water supply, circulating, transfer service, air conditioning, irrigation, and similar uses, a new centrifugal pump is announced by Goulds Pumps, Inc., Dept. I, Seneca Falls, N. Y.

Advance design gives simple, compact construction with high operating efficiency and ease of installation and maintenance. Four different support heads give suppliers greater economy in stocking.

Pumps are available in 14 sizes, for both motor and belt drives, in standard fitted, all-iron construction models. Capacities are from 10 to 1,800 gpm., with heads to 120 ft.



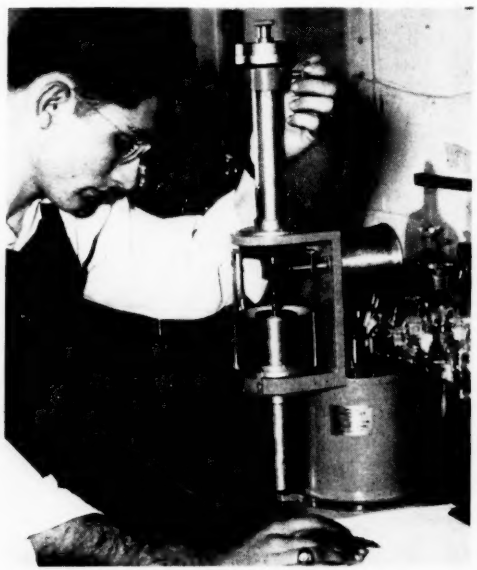
D. C. Flexibility From A.C. Power 2

Known as the Type H1, a new low-cost Thy-mo-trol drive is announced as available from stock by General Electric's Control Div., Dept. I, Schenectady, N. Y.

Furnished in ratings through ½ hp., the new drive utilizes a simplified half-wave circuit to provide d.c. flexibility from a.c. power. It is specially designed to provide, by the turn of a knob at a single control station, smooth, stepless speed control on small grinders, conveyors, pumps, and packaging equipment.

The drive operates from 220v., 60-cycle a.c. (for other voltages a suitable anode transformer is available). It has a 20-to-1 speed range from 1,725 to 86 rpm., and it operates efficiently in ambient temperatures from 50 to 104 deg. F. Drives come in either the non-reversing or the reversing type, the latter being equipped with a separate magnetic reversing switch.

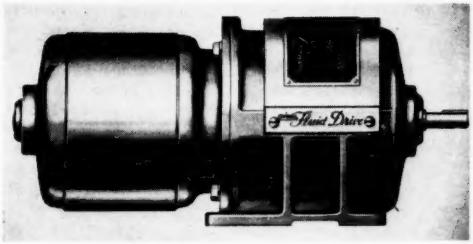
Designed for constant-torque loads, under normal conditions the new drive has excellent speed regulation from no-load to full-load. The speed may be pre-set or may be varied during operation and under load. Dynamic braking permits quick stopping. With normal industrial voltage fluctuation, the drive will operate satisfactorily, although it does not compensate for changes in line voltage. Maximum tube life is obtained when the voltage fluctuates no more than 5 percent.



Improved Viscosimeter 3

Designed specifically for the measurement of viscosity in plastic fluids and thixotropic suspensions or any other non-Newtonian fluids in which viscosity varies both with rate of shear and with time, the Texaco viscosimeter is being manufactured and distributed by Southwestern Industrial Electronic Co., Dept. I, Houston, Tex.

The instrument features: (1) A wide range of positive, fixed speeds; (2) stroboscopic arrangement for checking rotor speeds; (3) high velocities, to allow fluids to reach equilibrium viscosity; (4) continuous recording for any length of time; (5) completely friction-free torque measurement, due to torsion wire suspension; (6) oil damping, which insures steady readings on heavy fluids; (7) ample power to break gels, making accurate determination of gel strength possible; (8) agitation of entire sample; (9) special rotor and cup for laminar flow studies; (10) elimination of channeling; and (11) use with various cups and rotors. The instrument was developed for The Texas Co. by Dr. Allen D. Garrison, of Rice Institute, Houston.



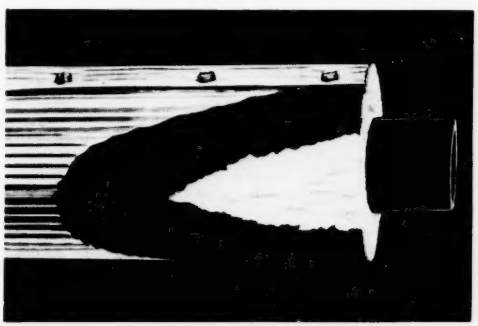
Fluid Drive Power Unit 4

Beginning Mar. 1, 1949, a new line of hydraulic electric power units with built-in gyro fluid drive will be marketed by American Blower Corp., Dept. I, Detroit, Mich.

The new units will be manufactured in sizes ranging from 1 to 20 hp. Each will have standard NEMA mounting bolt hole dimensions. All will be delivered complete with electric motors.

First models to come off the production lines will be powered with 5 and 7½ hp. motors. Other sizes are scheduled for production in the early fall.

The maker states that low starting current, smoother acceleration, overload protection, and shock absorption are among the advantages for operators who use centrifugals, conveyors, mixers, and other machinery. The company says that no on-the-job engineering is necessary, that no expensive controls are required, and that wiring is actually simplified.



Aluminum Jacketing on Insulation 5

Metal jacketing for the protection of industrial insulated lines is announced by the Childers Mfg. Co., Dept. I, Houston 7, Tex.

It is made from a lightweight aluminum sheet, corrugated for additional strength and for simple application.

Jacketing comes complete with moisture barrier attached. It is stated that no metal jacket should be used over 85 percent magnesia (and certain other insulation material) without a moisture barrier between the jacketing and the insulation.

The new easy-to-handle material can be fastened at the joints by screws. It is shipped in rolls (4 ft. wide x 100 ft. long) wrapped individually in heavy corrugated cartons and weighing aproximately 63 lb.

Jacketing is manufactured from .0055-in-thick 25 full-hard aluminum with $^{3}/_{16}$-in. corrugations for strength.

The moisture barrier has a base of 70 lb. kraft paper, fully impregnated with special asphaltic compounds, then coated, both faces, with a sealing mixture of Gilsonite, resins, waxes and special asphalts.

Automatic Produce-Bag Sealer 6

Bags are reported sealed at the rate of 50 to 95 per min. by a newly improved automatic bag sealing machine made by Consumer-Pak Machine Co., Dept. I, Pomona, Calif.

Bags hanging from hooks in an overhead conveyor are carried between two rolls of sealing tape and closed by pressure.

The new mechanically operated sealer is stated to improve upon previous models in simplicity as well as speed. It weighs only 150 lb. without conveyor.

(Continued)

EASY WAY TO GET MORE INFORMATION—fill out coupon below, tear out and mail to Food Industries Reader Service.

Your Company Name_____

Address_____

Your Name_____

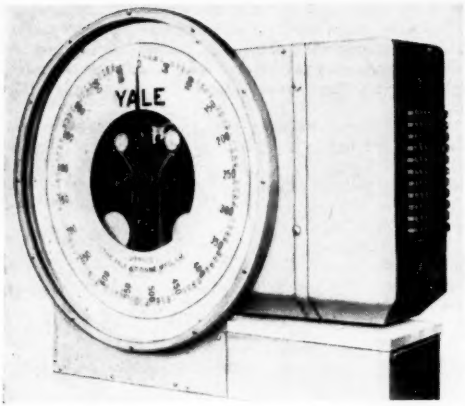
Your Title_____

To Reader Service Department, Food Industries
330 West 42nd St., New York 18, N. Y.

I would like to know more about the following items mentioned in March Food Equipment News:

(Print identifying numbers here)

☐ ☐ ☐ ☐ ☐ ☐



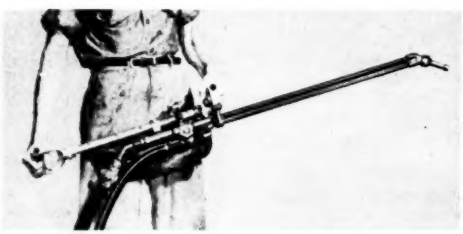
Scale-Weight Printer 7

To eliminate the uncertainty of the lead pencil and human element, actual weights are printed on tickets by a new type of weight printer now being offered as an integral part of Load King industrial scales. Maker is Yale & Towne Mfg. Co., Dept. I, Philadelphia.

Moreover, various weights in a series can be identified by printing opposite the recorded weight from one to eight symbols, numerals or letters. Therefore, more accurate data becomes available for inventory control, shipping records, production records, wage incentives, and the like.

Other features include: (1) Elimination of slow-dragging or floating pointer action; (2) hinged selector fingers which prevent damage to the selector fingers or printing disk mechanism should the printer be operated while a load is being moved on the scale; (3) printing beyond the full capacity of the dial in the event of careless or accidental operation of the printer with the pointer beyond the last graduation; (4) automatic reversing of the ink printing ribbon by means of an Alnico magnet; and (5) a continuous-duty electric motor which assures uninterrupted operation.

Printer can be adjusted to take tickets from 3 x 5 in. up to 8½ x 11 in. with one to four copies.

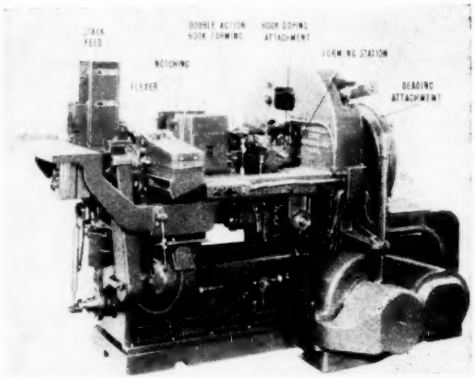


Steam Gun for Plant Cleaning 8

To facilitate volume cleaning operations in industrial plants, steam gun Model 481 has been added to the line of equipment offered by Oakite Products, Inc., Dept. I, New York City.

Outstanding feature of the gun, the manufacturer reports, is its ease of handling, made possible by special construction (see photo). It has an overall length of 5 ft., is ruggedly constructed, and is so balanced that it may be used over extended periods without tiring the operator. Two space-type, insulated handles are provided and are so located that each of the operator's hands support the same weight during a high pressure steam-cleaning job.

The forward handle remains stationary in the operator's grasp as the gun is rotated, while the rear handle is turned to rotate the gun when cleaning "underneath" and hard-to-reach surfaces. Steam and solution hoses are connected by swivel joints and remain stationary when the gun is rotated, thus eliminating bothersome twisting of hose lines during the cleaning operation.



Dry-Package Automatic Can Maker 9

For use primarily on dry-package work or talcum-type cans that must be sift-proof, a new, fully automatic bodymaker has been introduced by the Lima-Hamilton Corp., Dept. I, New York City.

An adjustable beader, is built into the bodymaker, takes the can body after it is formed and makes one single bead around the entire circumference of the can near the top. This beader also starts the top edge of the can inward for subsequent cover assembly. This tooling can also be arranged for inward or outward flange, if desired.

The precision-made bodymaker can turn out square, rectangular, round or oval can bodies, and may also be converted for plain side seam.

With a completely automatic feed, the unit can handle either lithographed or plain sheets. A roll-doping attachment applies compound to both hooks where required for side seams.

The unit is equipped with a 3-hp. motor for main drive, and a 1-hp. motor for the flexing attachment.

Sheet metal is so worked by the flexer that it will form easily into perfect shape. Complete electrical controls include electric interlocking for stopping the machine in the case of a jam.

In operation, blanks are fed automatically from the stack feed through the flexer. From this point, the blanks are then processed through the notching attachment, and then receive the "Mennen-type" side seam in the double-action hook attachment before they go into the can forming station. Beading operation comes last, in the adjustable automatic rotary cam-action beading attachment.

Speed of the machine, handling plain seams, averages 300 per minute on round cans, and from 150 to 250 per minute with Mennen seam on other types of cans. Specifications: diameter of cans handled, 5/16 to 3 in.; heights, 1¾ to 4⅝ in.; flat blank lengths (regular seam), 3 7/16 to 10 in.

(Continued)

Don't let moisture or grease get the best of your wrappers

Does your product contain moisture? Does it contain fat or grease? Then Patapar Vegetable Parchment is the wrapper for you. Patapar has high wet-strength. It resists grease. Its clean, strong, white folds will help keep your product fresh and appetizing.

Patapar is furnished plain or printed with your brand name and a colorful design. Want us to create a printed Patapar wrapper for you?

Patapar is ideal for:

Butter wrappers	Cheese wrappers
Ham boiler liners	Vegetable wraps
Deep freeze wraps	Bacon wrappers
Fish wrappers	Milk can gaskets
Can liners	Oleomargarine wrappers

and hundreds of other uses

Patapar REG. U.S. PAT. OFF.

HI-WET-STRENGTH, GREASE-RESISTING PARCHMENT

Paterson Parchment Paper Company • Bristol, Pennsylvania

Headquarters for Vegetable Parchment Since 1885

WEST COAST PLANT: 340 BRYANT STREET, SAN FRANCISCO 7, CALIFORNIA

SALES OFFICES: 122 EAST 42nd ST., NEW YORK 17, N.Y. • 111 WEST WASHINGTON ST., CHICAGO 2, ILL.

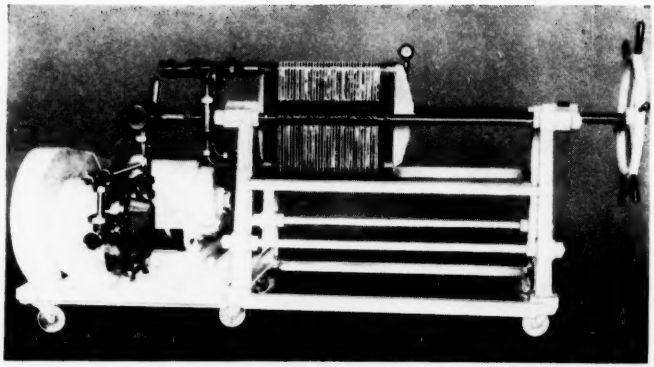
Learn how National Truck Leasing System will save you bookkeeping time and expense, with only a *single* delivery bill which includes all costs except the driver's salary —monthly or weekly as you prefer. Your invoice covers the basic rate for use of the truck, plus a specified charge for each mile the truck travels. Truck leasing will release capital investment, save executive time, eliminate maintenance worries, and provide modern, fully-equipped trucks . . . *at minimum cost to you.*

Call the phone number shown in your classified directory under this symbol.

NATIONAL TRUCK LEASING SYSTEM
NTLS

NATIONAL TRUCK LEASING SYSTEM
Dept. 1-2, 23 E. Jackson Blvd., Chicago 4, Ill

Have your secretary write today for our booklet explaining the basic advantages of truck leasing.



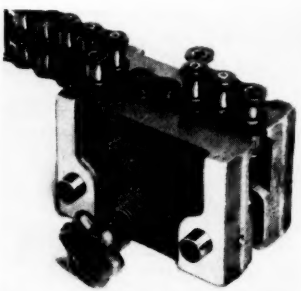
Sanitary Filter 10

Development of a new filter unit where all parts coming in contact with the liquid are stainless steel is announced by Ertel Engineering Corp., Dept. I, Kingston, N. Y.

The unit incorporates a sanitary stainless steel pump and is equipped with stainless steel fittings. Sight glass allows view of liquid clarity.

Closing of the filter is effected by a single handwheel. A stainless steel drip pan is provided to save valuable liquids. Working pressure is indicated at all times on the gage, and a pressure relief valve is standard equipment for complete safety.

This filter, designated as the EUS model, is built in sizes to accommodate from 10 to 100 low iron and calcium asbestos filter sheets, filter paper or filter cloth. Capacity is 5 to 30 gpm. Easy mobility is assured by six casters.

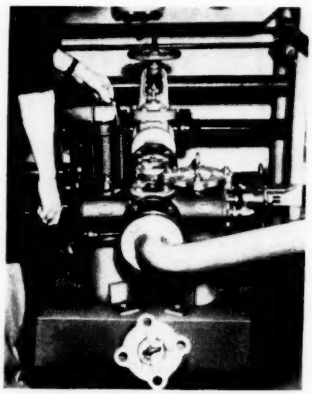


Chain Vises 11

To simplify the process of taking roller chain apart, two new chain vises have been placed on the market by The Baldwin-Duckworth Div. of Chain Belt Co., Dept. I, Milwaukee.

The forged steel jaws securely hold the chain while properly applied blows with an ordinary drift will quickly remove the pin. Each vise has jaws so shaped that the pin link to be removed has a firm seating on the edges of the jaws.

Both vises are easily adjustable to fit chains within their range of sizes. Vise No. 1 will handle single-width roller chains from $\frac{1}{2}$ in. to 1 in. pitch, and double-width roller chains D-40 and D-50. Vise No. 2 (shown here) will handle single-width chains from 1 in. to 2 in. pitch, and double-width chains from D-80 to D-160.



Duplex Strainer 12

Designed to handle fluids with a high solid content without the necessity of interrupting the pipe line operation to clean the strainer, a duplex strainer is announced by J. A. Zurn Mfg. Co., Dept. I, Erie, Pa.

These units are suitable for intermittent as well as continuous flow. Their flexibility of design permits the handling of sudden surges of solids.

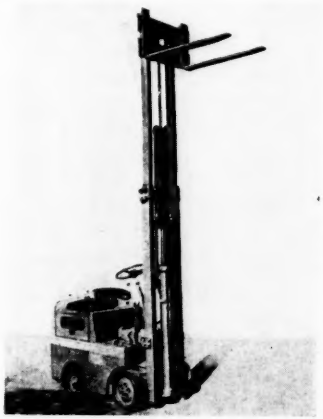
Flow through the unit is diverted from one straining chamber to another by a large, easily operated handwheel without the possibility of any positive shut-off. While flow passes through one straining chamber, the

other may be cleaned. Covers are removable for lifting out the perforated strainer baskets.

This strainer is adapted to high open area ratio and is suitable for a wide range of pressures and temperatures. Valve seats are removable, and valve stems are supported at both ends for accurate permanent alignment. A large handhole above each valve assembly permits servicing the valves without removing the strainer.

The strainer basket is set eccentrically, with respect to the basket chamber, so that the flow section is proportional to the flow needs at all points, thus minimizing pressure drop.

The strainer is available in bronze, steel, semi-steel and cast iron, with strainer baskets made to specification in perforated brass, Monel, or other metals, depending upon the service conditions. Mesh or magnetic types are also furnished to specifications.



High-Lift Fork Device **13**

Offered in a special design for Clipper fork-lift trucks (both gas-powered and electric battery-powered machines of the 2,000-lb. capacity) is a patented high-lift low-clearance device. Maker is Clark Equipment Co., Dept. I, Battle Creek, Mich.

Mounted on the truck, the Hi-Lo Stack, as it is called, permits an overall collapsed height of 83 in., max. lift of 130 in., and a free lift of 64 in., without increasing the overall height of the machine. These heights make it possible for the machine with its load to pass easily through 7-ft.-high opening and also to tier unit loads to the ceiling in boxcars with low clearances.

Important improvements in the device include a single hydraulic lift-cylinder and single set of uprights.

(Continued)

Insist on—

GENUINE Roccal

Reg. U. S. Pat. Off. and Canada BRAND

The ORIGINAL Quaternary Ammonium Germicide

SANITIZING AGENT

TO DO A BETTER SANITIZING JOB

EVERY TIME

243189R
This Control No. Guarantees
POTENCY
UNIFORMITY
QUALITY

Laboratory tested and Controlled

USES IN FOOD INDUSTRY

To Sanitize:

- STORAGE BINS
- FREEZING UNITS
- REFRIGERATORS
- CONVEYORS
- TANKS
- PROCESSING EQUIPMENT
- PACKAGING EQUIPMENT
- TRUCKS
- WALLS AND FLOORS
- WASH ROOMS
- AND AS A HAND RINSE FOR HELP

In the Food Industry, the importance of using only the best in sanitizing methods cannot be over-emphasized.

In Roccal, the *original* quaternary ammonium germicide, the food industry is offered a sanitizing agent that is laboratory controlled and tested. The uniform quality of Roccal means uniformly good results in doing a proper sanitizing job.

Roccal is a powerful germ-killer. In recommended dilutions, it is non-poisonous, virtually odorless and tasteless. It is non-irritating to the skin and no more corrosive than plain water.

Roccal can be used for every sanitizing job in processing and packaging in the following food industries: milk, cream, ice cream, butter, cheese, egg breaking, sugar, fish, poultry, fresh frozen vegetables and fruits, meat products, cereal products, candy and beverage, wherever the product comes in contact with equipment. Also to keep walls and floors sanitary.

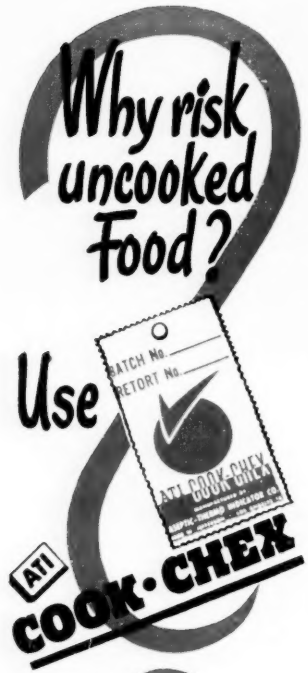
Start using Roccal today — you'll find that better sanitation is good business.

Fortify all your milk with **DELTAXIN®** *The purest known form of* ***Vitamin D₂***

SPECIAL MARKETS—INDUSTRIAL DIVISION

Winthrop-Stearns INC.

170 VARICK STREET, NEW YORK 13, N. Y., Dept. W-39



No Error!

Simply place an ATI Cook-Chex retort tag on each basket before cooking. When tag turns green, you *know* the food is fully cooked.

No Worry!

ATI Cook-Chex retort tags are unfailingly accurate. They guarantee you against human error. They safeguard consumer good-will and company profits.

No Loss!

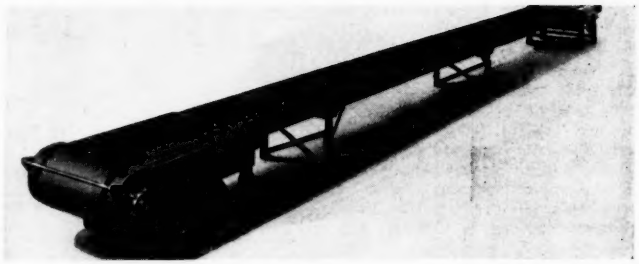
ATI Cook-Chex prevent waste or spoilage, and they cost so little. Less than 1/50¢ per case.

THESE LEADING RETORT CANNERS USE ATI COOK-CHEX:

Burnham & Morrill Co.
California Packing Corp.
College Inn Food Products Co.
The Columbia Conserve Co.
Concord Foods, Inc.
Elkhorn Canning Co.
D. E. Foote & Co.
Gerber's Baby Foods
Gorton-Pew Fisheries Co., Ltd.
Grocery Store Products Co.
Hunt Foods, Inc.
Illinois Canning Co.
LaChoy Food Products
S. E. Mighton Co.
Matmor Canning Co.
Nu-Trishus Products Corp.
Riviera Packing Co.
Sun Harbor Packing Co.
Sylmar Packing Co.

WRITE FOR FREE SAMPLES AND COMPLETE INFORMATION

ASEPTIC—THERMO INDICATOR CO.
5000 W. JEFFERSON BLVD., DEPT. 3444
LOS ANGELES 16, CALIF.



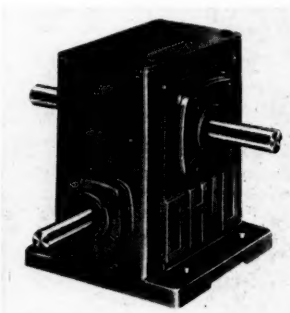
Belt Conveyor 14

Designed for horizontal application in handling cartons, boxes and bags, a belt conveyor named "Power-Veyor" is announced by Rapids-Standard Co., Inc., Dept. 1, Grand Rapids, Mich. It is available in belt widths of 8, 12, 14 and 20 in., and is built for permanent or semi-permanent installation. The unit fills the need for a horizontal belt conveyor in lengths up to 150 ft.

The conveyor is comprised of the following parts: a drive section, with motor and drive pulley; intermediate sections of gravity conveyor; and a take-up section. An idler roller to permit return of the belt is built into supports provided for the intermediate gravity conveyor sections.

Gravity conveyor sections available for the intermediate sections are of two types: Type A, with rollers projecting above; and Type B, with rollers below the channel frame.

The conveyor is equipped with a 3-ply, 28-oz. canvas duck, rubber-impregnated and vulcanized friction-top and friction-backed belt. Other types of belts are available for special applications.



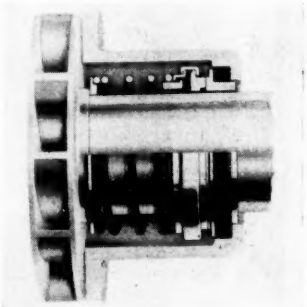
Speed Reducer 15

Announcement is made of a new single reduction speed reducer in the "baby" size by the Ohio Gear Co., Dept. I, Cleveland.

Designated as BHS, the new unit comprises a right angle drive with input shaft below and the work gear or output shaft above.

Overall dimensions are: 4¾ in. long, 3 in. wide, and 6¼ in. high. Ratios available range from 6-1 to 58-1; input hp. is from ⅛ to ⅝; and output torque (1800 rpm. input) ranges from 103 in.-lb. to 168 in.-lb., depending on ratio.

Input shaft dia. is ½ in. with 1-⅝ in. extensions; output shaft diameter is ⅝ in. with 1⅛ in. extension. Housing is of aluminum alloy. Base is 5 in. wide and 4¾ in. long.



Shaft Seal 16

Advanced design and ease of installation are features attributed to the new rotating shaft seal, "Roto-Flex," developed by Gits Brothers Mfg. Co., Dept. I, Chicago.

This seal is said to be suitable for such applications as water, oil, and gasoline pumps, water circulators, refrigeration compressors, speed reducers, and numerous other industrial units. It is claimed to be a positive seal that prevents leakage of liquids or gases along a rotating shaft when under pressure or vacuum.

The rotating member, called the "seal nose," is an integral unit and cannot come apart. It is held by a compression spring against the fixed surface, or "stationary seal."

Operating conditions determine amount of spring pressure necessary to make sealing positive, as well as the

materials used for the lapped wearing surfaces and other component parts. In addition to the single "Roto-Flex," double units (two rotating seals mounted on opposite ends of the compression spring) also are furnished. These are designed for such installations as one where the liquid being sealed cannot act as a lubricant or coolant, and a separate liquid supply is admitted into the seal chamber.

Vacuum Control 17

Selective-point vacuum control and greatly extended range feature the new Skanscope Vacuum Monitors announced by the Skaneateles Mfg. Co., Inc., Dept. I, Syracuse, N. Y.

Utilizing controlled gas-discharge tubes as their basic sensing element, the monitors are "Go-No-Go" vacuum indicators and gages.

These monitors are uniformly sensitive to concentration changes, are extremely accurate for repetitive operations, require no recalibration, and will hold a given vacuum value on dynamic systems within ±1 percent.

Because of their design and error-compensating features, states the manufacturer, there is automatic avoidance of many common ills, such as ambient temperature effects, false reactions to the presence of condensibles, wavering due to normal line voltage fluctuations, and calibration difficulties.

They exercise continual and accurate control over the pressure (concentration) level, within any engineered processing system, through remote automatic valve operation, by automatically graded leak or by direct prime mover actuation. In proper combination, the monitor may be employed to furnish closely predictable gas mixture percentage at low concentration levels.

Precision signal and relay output control features assure positive control at all times. Control can be used with temperature, time, and/or recording equipment, and the degrees of vacua required through a given process can be controlled on a time-precision basis. Range is from 100 mm. Hg to 5 microns absolute.

EFFECTIVE LUBRICATION
in spite of
moisture
Write for a copy of "The LUBRIPLATE FILM" written especially for your industry.
LUBRIPLATE
DEALERS FROM COAST TO COAST
CONSULT YOUR CLASSIFIED TELEPHONE BOOK

Operation of production machinery in the presence of moisture, steam and acids has always been a serious problem in many processing industries. There are a number of LUBRIPLATE Lubricants that satisfactorily meet these unfavorable operating conditions, thereby protecting machine parts against rust and corrosion.

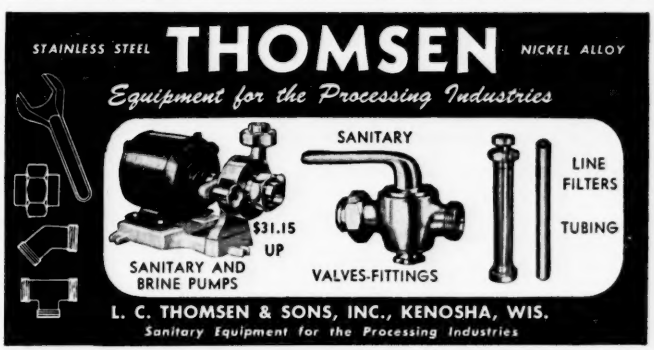
If You Are Having Difficulty Maintaining Your Mailing Lists...

Probably no other organization is as well equipped as McGraw-Hill to solve the complicated problem of list maintenance during this period of unparalleled change in industrial personnel.

McGraw-Hill Mailing Lists cover most major industries. They are compiled from exclusive sources, and are based on hundreds of thousands of mail questionnaires and the reports of a nation-wide field staff. All names are guaranteed accurate within 2%.

When planning your direct mail advertising and sales promotion, consider this unique and economical service in relation to your product. Details on request.

McGraw-Hill Publishing Co., Inc.
DIRECT MAIL DIVISION
330 West 42nd Street New York, 18, New York



Improve Your Packages with

FLEXPAK*

H & D CORRUGATED Wrapping Paper

If a product is worth wrapping, it deserves FLEXPAK*, a flexible corrugated "wrapping paper" that hugs the product and cushions it on all sides to protect it from shock, abrasion, puncture, corrosion, dirt and grit. Used just like wrapping paper, FLEXPAK* reduces breakage, saves packaging costs, conserves materials, cuts packing time. Your package is smaller, neater, lighter. Ask for a sample.

*REG. U. S. PAT. OFF.

REG. U. S. PAT. OFF.

H D

BOXES

FOR MORE INFORMATION, WRITE

HINDE & DAUCH

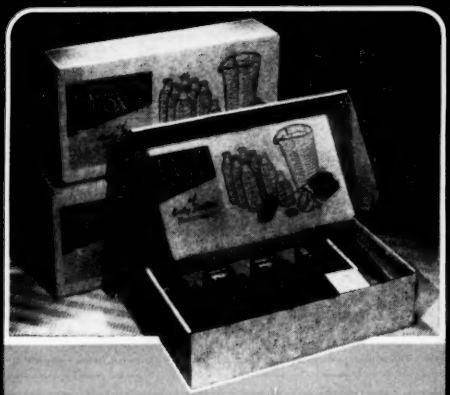
Authority on Packaging

Executive Offices: 4905 Decatur St., Sandusky, Ohio

FACTORIES IN:

Baltimore 13, Md. • Buffalo 6, N. Y. • Chatham, Ontario
Chicago 32, Illinois • Cleveland 2, Ohio • Detroit 27, Mich. • Gloucester, N. J. • Hoboken, N. J. • Kansas City 19, Kansas • Lenoir, N. C. • Montreal, Quebec
Richmond 12, Va. • St. Louis 15, Mo. • Sandusky, Ohio
Toronto, Ontario • Watertown, Mass.

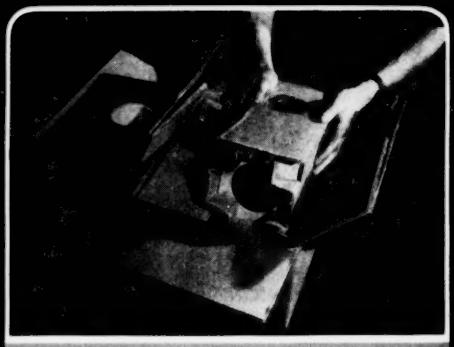
Designed for Protection . . . and SALES!



CLEVER MERCHANDISING

. Intelligent Packaging

A novel idea, such as the promotion of this "Father's Box," catches popular fancy with the help of good packaging. This H & D box is an example of good package design and colorful printing. It protects the merchandise in transit and displays it as an attractive gift. Give your product the advantages of planned packaging and watch sales climb!



CONCENTRATED WEIGHT

. . Shipped Safely in Corrugated

This electric motor, small as it is, requires more than casual packaging attention. It must have a super-strength box, especially designed to accommodate the uneven contour of the housing. H & D package engineers worked out this low-cost, easy-to-pack, two-piece unit, adding interior packing to give complete protection against all shipping hazards. Let H & D solve your packaging problem!

Catalogs, Bulletins

This digest of manufacturers' publications is for the information of executives, superintendents, packaging men, food technologists and purchasing agents. To get copies of this new literature conveniently, fill out the coupon below, tear out and mail to Food Industries Reader Service.

Food Plant Equipment

Belt Booster 51

Ball Bearing adjustable hump, snub, and end roller assemblies are pictured in detail in 2-page Bulletin PB-64-70-2A. Comprehensive chart on 28-deg. boosters is included.—*Island Equipment Corp.*

Fine-Dry Materials Conveyor 52

For transporting fine-dry materials, a revolutionary type of conveyor without moving parts is delineated in 12-page Bulletin F-H-1. Equipment is presented diagrammatically, and actual installations are coverd in photographs. —*Fuller Co.*

Wire Stitching Machine 53

Equipment for steel-wire sealing of carton bottoms, general box making, fastening, assembling and ticketing is detailed in 4-page bulletin. Construction features and specifications are given.—*N. A. Young Co.*

Magnetic Starters 54

Complete information concerning applications, sizes, classifications, construction features, enclosure dimensions, and other important data pertaining to newly designed a. c. magnetic starters of across-the-line non-reversing type, is given in 8-page Bulletin 4110.—*Ward Leonard Electric Co.*

Sanitary Ferrule 55

Expanding-type sanitary ferrules are illustrated and described in 1-page circular. Tools used for making joints with stainless steel tubing are also shown.—*Tri-Clover Machine Co.*

Liquid Separator 56

Equipment for production-volume separation of emulsions, in steam distillations, solvent extractions, and dewatering of solvents, is illustrated and described in 4-page Bulletin 730.—*Selas Corp. of America.*

Gas Welding Equipment 57

Shown in four color illustrations, a comprehensive portion of company's line of gas welding and flame cutting apparatus is covered in 39-page Bulletin 20B.—*Victor Equipment Co.*

Roller Gravity Conveyors 58

Latest accessories to Rapid-Roller line, including APB adjustable, permanent stands for stationary installations, new case steps, and wheel-type guard rails, are incorporated in Catalog RRC-48. Photographs accompanying specifications show typical uses of various widths and roller spacings of conveyors.—*The Rapids-Standard Co., Inc.*

Boiler Return Units 59

Type XA "Packaged" boiler return units are featured in Bulletin 200. Given are general catalog data and specifications of this new series employing company's turbine-type pump. —*Roy E. Roth Co.*

Free Swinging Sifter 60

Sanitary and mechanical features of a new free-swinging sifter are described in a 4-page Bulletin 0637180. Driving mechanism operates the sifter in a true circle. This gyratory circle can be varied to suit the stock being sifted (circle may be changed from 2¼ to 4 in. in dia. in ¼-in. steps) without adding or removing balancing weights.—*Allis Chalmers.*

Totally Enclosed Motors 61

Fan-cooled totally enclosed motors with tube-type air-to-air heat exchangers are described in new Bulletin 05B7150. Motors are available in squirrel cage, wound rotor, and synchronous types, for vertical or horizontal installation. Ratings range from 150 hp. at 1,200 rpm. to several thousand hp. at standard speeds of from 3,600 rpm. down to about 300 rpm.—*Allis-Chalmers.*

Filter Presses 62

Design and construction of filter presses are illustrated and described in 25-page bulletin, "A Guide to Better Filtration." Industrial application, capacities, comparison of filter plate types, information on washing of the filter cake, control of leakage, filter media, and aids are covered.—*T. Shriver & Co., Inc.*

Rotary Positive Blowers 63

Complete views and cross sections, with condensed specifications covering the four standard types, of rotary positive blowers now offered are included in 20-page Bulletin 232-23-B-13. Listed are various types of accessories recommended and furnished, including relief valves. Some of the more widely known applications are specially considered.—*Roots-Connersville Blower Corp.*

Sanitary Piston Pump 64

Designed especially for use in the food processing industry, the new Votator 3-cyl. sanitary radial piston pump is presented in 1-page bulletin. Capacities, operating pressures, and construction materials and dimensions are given.—*The Girdler Corp., Votator Div.*

Ice Cream Packaging Equipment 65

Termed ideal for small and medium size plants, a semi-automatic ice cream packaging machine is described in 1-page bulletin. Equipment is illustrated. Operating and electrical specifications are given in table form.—*Pure-Pak Div., Ex-Cell-O Corp.*

Stainless Steel Tanks 66

Horizontal and vertical stainless steel tanks are pictured, shown diagrammatically, and described in 16-page Bulletin 146. Location of tanks in various processes are indicated on flowsheets. Sanitary power units are also included.—*Mojonnier Bros. Co.*

Hot Water Generators 67

Fully automatic, gas or oil fired industrial hot water generators, shipped as a complete package, are covered in 4-page bulletin. Operating and construction features are shown. Specifications and dimensions are listed in table form.—*Cleaver-Brooks Co.*

Meat Ball Machine 68

For production of meat balls mechanically, Cut Rol Model 100, a machine which extrudes, cuts, rolls and dusts meat mixtures and forms them into balls of uniform size and weight, completely separate and ready for braising or canning, is described in 4-page bulletin.—*Alba Engineering, Inc.*

Steam Humidifier 69

Uses of steam humidifiers, to reduce losses in weight, quality, production and human efficiency, are recommended in 12-page Bulletin 1771. Various type humidifiers are illustrated. Electrically and air operated installations are shown diagrammatically.—*Armstrong Machine Works.*

Stainless Steel Tubing 70

Applications, corrosion-resistance data, and properties of various types of stainless steel tubing, also fabricating data on welding, soldering, annealing and machining, are covered in 27-page catalog, "Electrunite, Enduro Stainless Steel Tubing."—*Republic Steel Corp., Steel & Tube Div.*

Dairy Cooler 71

How one piece of equipment does the work of two in a dairy is described in 4-page Bul-

(Continued)

Your Company Name _____

_____

Address _____

_____

Your Name _____

Your Title _____

To Reader Service Department, Food Industries
330 West 42nd St., New York 18, N. Y.

I would like copies of the following items mentioned in March "Catalogs and Bulletins."

(Print identifying numbers here)

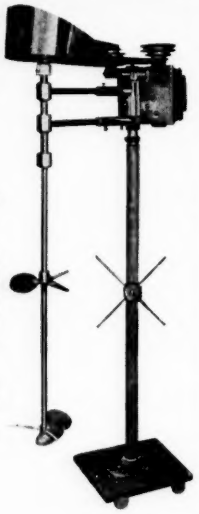
☐ ☐ ☐ ☐ ☐ ☐

New! **TERRISS 3-SPEED**

PORTABLE MIXER

STIRS • BLENDS
MIXES • AGITATES

No more carrying heavy mixer . . . clamping to tanks . . . breaking side walls.



The New TERRISS 3-Speed Portable Mixer is an all-around unit that will take care of all your mixing, blending and agitating problems. If your tank or vat is below floor level the TERRISS 3-Speed Mixer will reach down and do a real job for you. If your container sits on the floor, a little adjustment and the mixing begins. If your tank or container is high off the floor, the TERRISS Mixer will lift up and do the mixing job.

All parts that touch your product are Stainless Steel. Standard belt drive permits propeller speeds of 175 RPM, 325 RPM and 575 RPM. Other combinations are available with simple adjustments. Both propeller shaft and stand are adjustable, permitting unlimited settings to fit any job in your plant.

Send your order today . . . money-back guarantee

TERRISS
• • • • DIVISION OF *Consolidated Siphon Supply Co., Inc.*

MANUFACTURERS SUPPLYING THE PROCESSING INDUSTRIES

DEPT. F, 22-24 WOOSTER ST. **NEW YORK 13, N. Y.**

These 55 gallon barrels are never spoken of as "back busters" in this modern food processing plant. A unique A-F Barrel-Handling System, in addition to the A-F Completely Co-ordinated product-handling Conveying System, takes all the hard labor out of moving the barrels.

Alvey-Ferguson's 48 years of conveyor know-how assures you that every factor that can effect new economies will be considered in the engineering of an A-F Completely Co-ordinated Conveying System for *your plant.*

It will pay you to get more information
Write for free illustrated folder—today!

The Alvey-Ferguson Company

176 Disney Street ***Established 1901*** **Cincinnati 9, Ohio**

Offices or Representatives in Principal Cities - Coast to Coast

letin 70. Diagram shows the "Dual" cooler which (1) provides chilled water (35 deg. F.) to cool a plant's daily fresh milk capacity as it comes from pasteurizer, and (2) cools and holds the milk room at correct temperature.—*Niagara Blower Co.*

Evaporative Condensers **72**

Use of Freon 12 evaporative condensers as a satisfactory method of cutting operating costs where water for use in refrigerating condensers is high in temperature, expensive, or difficult to secure or dispose of, is covered in 8-page Bulletin C-1100-B28. Specifications and capacity ratings are given.—*Worthington Pump & Machine Corp.*

Cooking Kettles **73**

Gas and electric stainless-steel steam-jacketed kettles are described in 1-page bulletin. Capacity in gallons, dimensions, and shipping weights are given in table form. Operation and sanitary features are covered.—*Groen Mfg. Co.*

Plant Supplies

Protective-Film Brand List **74**

"Brand Names and Shippers" is book issued annually to enable merchants to order, by brand name, fruits and vegetables protected by Flavorseal. This is a wax-like protective film which a specially designed machine sprays over fresh fruits and vegetables in the packing house to help keep them fresh longer. Book lists shipper of film-protected oranges, lemons, grapefruit, eggplant, persimmons, tangerines, cucumbers, bell peppers, melons, and tomatoes.—*Food Machinery & Chemical Corp.*

Steel Bands, Sealers **75**

For banding all types of packages, bales, boxes, bundles and pallets, 6-page brochure describes new line of products—"Steelband" tensioners, sealers, and accessories.—*Allegheny Steel Band Co.*

Information on Cellophane **76**

To better understand the various kinds of cellophane, brochure titled "Characteristics and Uses" has been made available, together with a leaflet which compares and identifies former cellophane type designations with present designations. A new price list also has been included.—*Sylvania Div., American Viscose Corp.*

Flavors, Chemicals and Colors **77**

Flavors for bakeries, carbonated beverages, hard and soft center candies, gelatin desserts, and ice cream manufacture are listed in 31-page "Alva Flavors" bulletin. Included are aromatic chemicals, essential oils, concentrated citrus oils. Primary and secondary certified food colors are also covered. Prices are given on flavors and colors.—van *American-Haebler, Inc.*

Control Equipment

Electric Controls **78**

Latest edition of Catalog 52E presents a complete line of automatic pressure, temperature, level and flow controls. Equipment is illustrated and described. Prices are given in supplementary schedule (Form 601.191).—*General Controls Co.*

Thermocouple Manual **79**

Information on selection of proper thermocouples and protecting tubes, methods of checking thermocouples and pyrometers and installation data is provided in 40-page illustrated Bulletin T/C 7. It lists thermocouples, thermocouple wire, lead wire, heads, connec-

(Continued)

Presenting

NYTRON

TRADE-MARK REG. U. S. PAT. OFF.

a totally different type of Synthetic Organic Detergent with an EXCLUSIVE COMBINATION OF PROPERTIES

EXCEPTIONAL detergency

UNIQUE solubility range

UNCOMMON chemical stability

UNUSUAL resistance to hard water

DEPENDABLE wetting and emulsifying action

● **The exclusive** composition of NYTRON offers you a combination of properties never before available in any single synthetic organic detergent. As a result, NYTRON has already found unique application in a wide range of industries. For example . . . NYTRON is gentle enough for laundering sheer synthetic fabrics, yet powerful enough to clean greasy overalls or aid in the pickling of steel. Send for technical data and specific information on how NYTRON can be used to advantage in your business. Mail the coupon now.

A SOLVAY PRODUCT

Get All the Facts on NYTRON . . .

Mail this Coupon NOW

SOLVAY SALES DIVISION, Allied Chemical & Dye Corporation
40 Rector Street, New York 6, N. Y.

I want to know more about NYTRON, the entirely *new type* (patented) Synthetic Organic Detergent, and what it can do for my business. Please send me detailed non-technical information and specific technical data on NYTRON.

Name .....

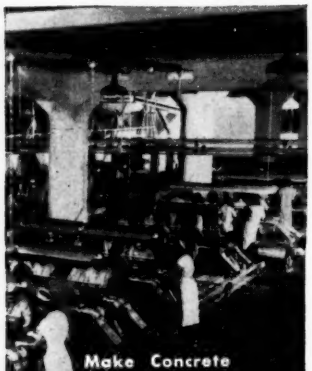
Title .....

Company .....

Type of Business .....

Address .....

..... FI-3



Make Concrete

FLOORS

last longer . . . look better

with

NUKEMITE

40

PROTECTIVE COATING

● Offering wear resistance superior to standard oil based floor enamels, NUKEMITE 40 Protective Coating is also ideal where chemical action is a factor. It is produced in several colors, making it possible to give your plant floor a cleaner, more attractive appearance.

Nukemite 40 is a vinyl copolymer solution that bonds firmly and forms a tough coating when dry. It resists acids, alkalies and petroleum solvents—does not saponify when subjected to cleaning agents—gives long-lasting protection even under severe abrasive conditions. It is odorless, tasteless and non-contaminating; fully tested and proved in a wide range of practical applications.

EASY TO APPLY

Nukemite 40 is easily applied by brush or spray method after preparation of the floor by cleaning and rinsing. Minimum out-of-service time (36 hours) is required for application of primer, application of Nukemite 40, and drying — another NUKEMITE feature.

Specify Application and Order a Trial Kit Today. $3.30 prepaid.

Name_____

Company_____

Address_____

Nukem

NUKEM

PRODUCTS CORPORATION

100 Colgate Avenue

BUFFALO 20, N. Y.

tors, plug and socket assemblies, insulators, protecting tubes and radiation heads. Prices are given.—*Wheelco Instrument Co.*

Thermocouples and Pyrometers **80**

Detailed information on thermocouples, protection tubes, and other pyrometer accessories is contained in 56-page Bulletin P1238. A technical section, described as the "User's Manual," contains engineering handbook data on such subjects as factors affecting thermocouple life, corrosion and poisoning, thermocouple reproductibility, and insulation. Book is conveniently indexed, and is liberally illustrated with line drawings and photographs.—*The Bristol Co.*

pH Control Instruments **81**

Application of pH and conductivity control to different industrial processes is a feature of 43-page Catalog 15-12. Illustrated with photographs and schematic drawings, it includes a partial list of circular and strip charts and scales and dimensional diagrams of pH equipment.—*The Brown Instrument Co.*

Sewage Control Instruments **82**

Presented primarily to acquaint engineers, superintendents, and operators with the many applications of measuring and controlling instruments for sewage and waste processes, is 43-page Catalog 7301, titled "Instrumentation for Treatment of Sewage and Industrial Wastes." Applications are presented in schematic diagrams. Instruments are described with illustrative photographs and dimensional drawings—*The Brown Instrument Co.*

Control Equipment **83**

Photoelectric control for general industrial and machinery applications is described in Bulletin PA 478. Equipment is reported particularly efficient in counting, conveyor control, motor or valve control, and production inspection.—*Photoswitch, Inc.*

Miscellaneous

Shipping Container **84**

Welded steel shipping container proportioned to fit in the holds of ocean-going ships, lake vessels, and standard river barges, also in standard and narrow gage railroad cars, and highway trucks and trailers, is detailed in Bulletin 220.—*Dravco Corp.*

Cold-Finished Steel Bars **85**

Table of average mechanical properties, a description of the finishing processes, guide to selection, AISI and SAE standard steel compositions, and a condensed listing of analyses, finishes and shapes carried in stock, are contained in 8-page bulletin, "Cold Finished Steel Bars." Among bars covered are low and high carbon shafting quality, also screw and carburizing steels. Bars are available in the form of rounds, squares, hexagons, flats and angles.—*Joseph T. Ryerson & Son, Inc.*

Air and Carbon Dioxide Sampler **86**

Operation of a new sampling device to aid in the determination of the air content of liquids, whether carbonated, partially carbonated or uncarbonated, is presented in 15-page bulletin, "Air and CO_2 Volume Tester." Procedures are clearly outlined step-by-step, with descriptions of the application of the sampling device and the tester with which it is used.—*Schwarz Laboratories, Inc.*

Laboratory Apparatus **87**

Detailed in 64-page catalogs are varied laboratory apparatus and also chemicals. Apparatus is illustrated and described. Alphabetical index simplifies reference to specific items. Prices are given.—*The Kauffman-Lattimer Co.*

MAXIMUM STEAM EFFICIENCY –

Valuable waste heat recovered and put to work by Cochrane C-B System . . . new developments in better steam usage increase process production by maintaining high and uniform temperature at equipment.

THE COCHRANE C-B SYSTEM— WHAT IT IS

The Cochrane C-B System is actually two pumps in one. A specially designed centrifugal pump energizes an eductor. It pumps the condensate from drainage return lines into the boiler against boiler pressure, in a closed circuit, at any temperature or pressure—with complete, automatic elimination of entrained air from the circuit before discharging the condensate into the boiler.

The C-B System speeds up the flow of condensate and eliminates the entrained air with the condensate from the process equipment. This results in a higher temperature on the heating surface from a given initial steam pressure—increasing the heating efficiency often as much as 20%, increasing production as high as 61% and effecting fuel savings from 10 to 25%.

WHAT FASTER AND MORE UNIFORM HEATING IS DOING FOR THE PROCESS INDUSTRY

The following excerpts were taken from enthusiastic letters of Cochrane C-B users:

"Our cooking time has been reduced 50%."

"With 15% less fuel we increased production by 20% by faster cook which improved our product materially. So pleased we are installing a second unit in another plant."

"We saved $6000 a year on steam recovered."

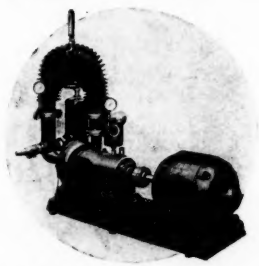
"Capacity of our jacketed kettles has been increased 50%."

"We doubled our plant capacity without adding any additional equipment."

"Faster heat improved the quality and texture of our catsup. We also cut our cooking time in half."

"We practically doubled our preserve output."

"Our quality has been much improved because of the faster cooking. Spoilage has been practically eliminated."



For full details of the C-B System write for a copy of Publication No. 3250.

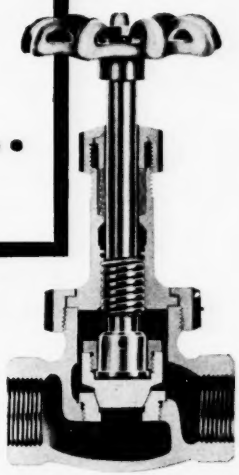
COCHRANE CORPORATION

3117 N. 17th Street Philadelphia, 32, Pa.

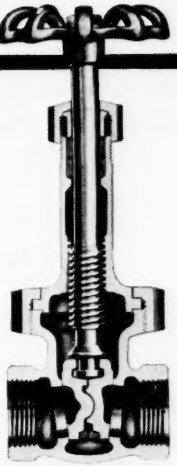
COCHRANE CONDENSATE C-B BOOSTER SYSTEM

OF HIGH PRESSURE, HIGH TEMPERATURE CONDENSATE RETURN

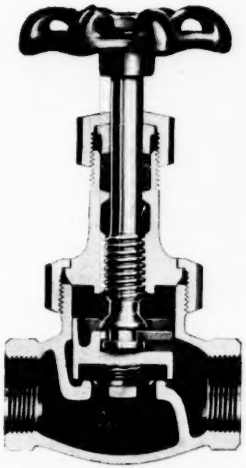
Walworth bronze valves...



Walworth No. 225P Globe Valve
500 Brinell Seat and Disc



Walworth
No. 29 Gate Valve



Walworth No. 95 Globe Valve
Re-New-Disc

built to give dependable trouble-free service on all recommended jobs

Walworth No. 95 Bronze Globe Valves (Angle Type: No. 96) are recommended for service where throttling is not required. They are rated at 150 psi working steam pressure, 500F; 300 psi cold water, oil or gas. The improved renewable disc and lock-on, slip-off disc holder — an original Walworth development—saves time and trouble. This valve can be repacked under pressure when fully opened. All parts are designed to give maximum service and strength.

Walworth No. 29 Bronze Gate Valves are rated at 200 psi working steam pressure, 550F; 400 psi cold water, oil and gas. These valves have rising stems and integral seats. Sizes 2-inch and smaller have union bonnets; sizes 2½ and 3-inch have bolted bonnets. Valves up to and including ¾-inch have solid wedge discs; 1-inch and larger have split wedge discs. These valves can be repacked under pressure when fully opened.

Walworth No. 225P Bronze Globe Valves (Angle Type: No. 227P) are rated at 350 psi working steam pressure, 550F; and 1000 psi non-shock service on cold water, oil and gas. The stainless steel, plug type seat and disc — heat treated to 500 Brinell — can be closed on sand, slag, scale and similar floatage, without injury to the seating surfaces. They are the longest wearing, TOUGHEST bronze valves you can buy.

For full information about Walworth Quality Bronze Valves, see your Walworth distributor, or write:

WALWORTH
valves and fittings

60 EAST 42nd STREET . NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Announcing ...ANOTHER BECKMAN

ADVANCEMENT IN SPECTROPHOTOMETRY

THE BECKMAN MODEL "B" SPECTROPHOTOMETER

Accurate—Convenient—Versatile...and Low Priced

Note simplicity of controls. Also note the sloping panel that permits easy readability of scales from both sitting and standing positions.

ADVANCED FEATURES DESIGNED INTO THE MODEL "B" INCLUDE...

CONVENIENCE:

Direct reading wavelength scale . . . 320 to 1000 millimicrons . . . readings reproducible to great accuracy.

Direct reading transmission and absorbance (optical density) scales on large easily-read meter.

Continuously variable slits for smooth, precise settings.

4-Position sensitivity multiplier permits readings to be made on most advantageous portion of scale.

Four position cell carriage permits quick positioning of any of 4 cells by an external control.

ACCURACY:

Photometric accuracy to 0.5% transmission or 1% absorbance.

Negligible stray light—stray light effects completely eliminated between 360 and 1000 millimicrons . . . less than 1½% even at 320 millimicrons.

Resolution—permits less than 5 millimicron band width over most of spectral range.

VERSATILITY:

Liquid, solid and gaseous samples may be analyzed.

Monochromatic light beam is easily brought outside the instrument for long path measurements and special uses.

Accommodates large cells up to 50 m. m. path length in standard cell carrier.

Interchangeable photocells—red or blue-sensitive to utilize the high resolving power of the Model "B".

Easily-attached Model "B" accessories will be available for special types of measurements and for added convenience and accuracy. Write for details.

The new Model "B" Spectrophotometer is by far the outstanding routine instrument available. It provides advancements pioneered in the Beckman Quartz and Infrared Spectrophotometers but never before offered in a low priced instrument. These advantages are important because they combine simplicity, convenience and versatility without sacrificing accuracy and reliability.

The Model "B" has better ultraviolet performance . . . better resolution . . . better wavelength and photometric accuracy . . . and more freedom from stray light than any other instrument in its field.

A descriptive bulletin on the Beckman Model "B" Spectrophotometer will gladly be sent on request. Write today. *Beckman Instruments, National Technical Laboratories, South Pasadena 18, California.*

BECKMAN **INSTRUMENTS CONTROL MODERN INDUSTRIES**

pH Meters and Electrodes—Spectrophotometers—Radiation Meters—Special Analytical Instruments

New Technology

INDEX TO ABSTRACTS

BAKING
Vitamin Retention in Canned Bread ... 185
ENGINEERING
Concentrating Juices ... 185
Separator, Homogenizer ... 185
DAIRY
Wensleydale Cheese ... 185
FATS AND OILS
New Antioxidant ... 186
DEHYDRATION
Dried Grapefruit Peel As a Dairy Feed 186
CONFECTIONERY
Improved Sweet Chocolate ... 188
Coating Confections ... 188
FERMENTATION
Yeast Production ... 190
VITAMINS
Losses of Vitamin C In Stored Potatoes 190
MEAT AND FISH
Swordfish Composition ... 192
MISCELLANEOUS
Mechanism in Fungicides ... 194
Fumigant Absorption ... 194

BAKING

Vitamin Retention In Canned Bread

Stability of thiamine, riboflavin and niacin in canned bread during fermentation, baking and storage, is approximately the same regardless of the source of the vitamins.

Studies were made to compare synthetic, whole wheat and yeast enrichment of canned breads on the basis of B complex vitamin stability, contribution of protein and lesser known B vitamin factors, and palatability. Two levels of yeast enrichment were used —3 and 1 percent (flour basis). There were no significant losses of B complex vitamins through fermentation and proofing. During baking, the thiamine content was decreased approximately 15 percent. Riboflavin and niacin remain unchanged. During storage at 72 and 100 deg. F. for 6 months, thiamine retention was approximately 80 and 50 percent, respectively, regardless of the source of enrichment. Riboflavin and niacin were retained from 90 to 100 percent.

Yeast enriched and whole wheat breads, had better protein values than synthetically fortified bread. Bread with 3 percent yeast was judged not equal to the synthetically enriched bread in color, grain and eating quality. A 1 percent level of yeast, however, produced a bread more nearly equal in color, grain, texture and taste to bread fortified with synthetic vitamins.

Digest from "Effect of Fortification of Canned Bread on Stability," by S. Brenner, S. G. Dunlop and V. O. Wodicka, *Cereal Chemistry*, 367-76. Nov. 1948.

ENGINEERING

Concentrating Juices

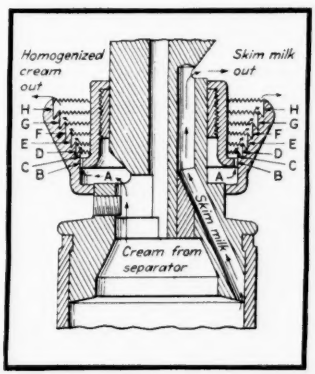
Evaporation and concentration of liquid food products without destroying, losing or impairing the vitamins or flavor-producing esters, is the object of a recently patented method.

The method calls for rapid flow of the liquid product in a thin film over a heat exchange surface under high vacuum. This separates it into a concentrate and a vapor containing the volatile flavor-producing ingredients. The vapor is drawn into a fractionating condenser which separates out a large part of the water. The remaining vapor, containing the flavoring esters, passes into a surface condenser and is condensed. The condensate is then reunited with the concentrate, restoring to it the original flavor.

Digest from U. S. Patent 2,450,774, issued Oct. 5, 1948, on an application dated Aug. 12, 1943, to Geo. G. Zahn, Buffalo, N. Y., and assigned to Hurd Corp., New York City.

Separator, Homogenizer

A combination cream separator and homogenizer has been developed and patented. The separator is of standard design. Cream, leaving the separator part of the equipment, discharges into a closed chamber *A* rotating with the separator bowl. Then by centrifugal force, the cream is discharged through small openings *B* onto a series of rotating blades *C-H*.



As the cream flows from the free edge of blade *C*, it is impacted against blade *D*. The cream then flows along blade *D* and is discharged from the serrated edge thereof against blade *E*, and so on with blades *F*, *G* and *H*. The cream leaving blade *H* is collected and discharged from the machine.

It is claimed that the impacting action of the blades produces a thoroughly homogenized cream.

Digest from U. S. Patent 2,453,924, issued Nov. 16, 1948, on an application dated Oct. 17, 1944, to J. B. McFadden, West Chester, Pa., and assigned to United Dairy Equipment Co.

DAIRY

Wensleydale Cheese

Spreading like butter, Wensleydale cheese is soft and flaky and has the delicate blue veinings well distributed throughout the curd. The skin is greyish white and the mark of the bandage shows clearly, particularly where it was stitched on. In flavor, the cheese is sweet, not acid or bitter.

Evening milk is cooled immediately to 65 deg. F. to avoid the development of too much acidity. Next morning, the cream is skimmed, mixed with some morning milk, heated to 90 deg. F., and combined with evening and morning milk. Starter is added at the rate of 1-3 oz. for 12 gal. of milk, depending on the season.

The whole is then heated gradually to 84 deg. F.; and after 0.18-0.19 percent acidity has developed, rennet is added at the rate of 1 dram to 4 gal. of milk. The mixture is stirred until signs of coagulation appear. The curd is cut lengthwise and across the vat with a vertical knife, then allowed to settle for 10 min., after which it is cut lengthwise with a horizontal knife. The curd is stirred gently from the bottom and allowed to settle for 20 min. During the next 20 min., the temperature is raised to 86 deg. F., with constant gentle stirring.

When the whey shows acidity of 0.14 percent it is drained. The curd is then scooped into cloths, drained on a rack, cut and turned repeatedly until the drainings show an acidity of 0.28 to 0.30 percent. It is then broken up, salted, placed loosely in molds, drained

(Continued)

"the proof of the FLAVOR is in the eating"
Years ago we established the Alva Test Kitchens—completely equipped for processing candies, baked goods, beverages and all food products under actual plant conditions. It is here that all Alva Flavors are tested "in the product."*
In well over 30 years of operation Alva Flavor chemists have formulated and kitchen-tested thousands of flavors developed for all products in which flavor is a factor. Chances are, we have already tackled a flavor problem paralleling yours.
* Another test indicative of Alva's "complete" job on flavors.
Alva IMITATION MAPLE
has been the choice of many well-known food manufacturers for years. The armed services, too, ordered ALVA MAPLE by the thousands of cases because of its downright goodness. Goodness is the reason . . . a true-to-life maple that in many formulas and processes is superior to the finest natural product.
Alva FLAVORS
VAN AMERINGEN - HAEBLER, INC.
215 FOURTH AVENUE NEW YORK 3

for 2 hr., removed and wrapped, and replaced in the mold. After standing over night at a temperature of 65 deg. F., it is subjected to pressure of 600 lb. The final ripening process is complete in about 6 months.

Digest from "Wensleydale Cheese," *Food Manufacture*, Vol. 23, 449-54, Oct. 1, 1948. Reproduced from Bul. No. 43, Ministry of Agriculture & Fisheries.

FATS AND OILS

New Antioxidant

An antioxidant for animal fats which is superior to other commonly known antioxidants in stability and "carry-through" into cooked foods has been developed. It is a mixture of two isomeric phenols—2-tertiarybutyl, 4-methoxyphenol and 3-tertiarybutyl, 4-methoxyphenol—and is known as butylated hydroxyanisole.

It is most effective when used with a synergist or in combination with another phenolic antioxidant and a synergist. The stability of lard treated with butylated hydroxyanisole is increased 3.5-4 times by the addition of small quantities of hydroquinone or propyl gallate, and a synergist such as citric acid.

In addition to providing A.O.M. stability, butylated hydroxyanisole and antioxidant combinations containing it impart superior shelf life to lard. Samples stored at room temperature for periods of 2 yr. or longer attained neither organoleptic rancidity nor an appreciable peroxide value.

Crackers, pastry and potato chips, made with low concentrations of butylated hydroxyanisole combinations, remain fresh and non-rancid for periods of time far exceeding those for the same products prepared with lard stabilized with other antioxidants.

Digest from "Butylated Hydroxyanisole as an Antioxidant for Animal Fats," a paper by H. R. Kraybill, L. R. Dugan, Jr., F. C. Vibrans, V. Swartz, H. Rezabek and B. W. Beadle, presented at 22nd Fall Meeting of American Oil Chemists' Society, New York City, Nov. 17, 1948.

DEHYDRATION

Dried Grapefruit Peel As a Dairy Feed

Previous experiments have demonstrated that a marked increase in milk production was obtained when alfalfa was supplemented with corn silage, beet pulp or corn gluten meal in the feeding of dairy cows. New experiments were conducted to ascertain the value of dried grapefruit peel as a source of these milk stimulating factors.

Two sources of peel were used: Peel sun-dried in the desert, and mechani-

cally dried peel. Cows were fed first-cutting dry alfalfa hay until milk production decreased markedly. The alfalfa was then supplemented with 4-lb. dried grapefruit peel daily. In the case of 7 of the 8 cows used, there was a small but definite increase in milk production when the dried peel was added. In the case of the eighth cow, dried peel lessened the decline due to the alfalfa ration. There was no significant difference between results obtained with the two types of peel. The experiments indicate that grapefruit peel contains factors which stimulate milk production in dairy cows.

Digest from "Lactating Factors for Dairy Cows in Dried Grapefruit Peel," by R. N. Davis and A. R. Kemmerer. *Journal of Dairy Science*, 973-75, Nov. 1948.

CONFECTIONERY

Improved Sweet Chocolate

Elimination of conching and improved flavor of the resulting sweet chocolate are the objects of a recently patented process. The method comprises cooling a concentrated sucrose sirup at a rate sufficiently rapid to form a viscous super-saturated mass substantially free from sugar crystals.

Then comes uniform mixing of the mass with a liquefied chocolate liquor at a temperature below the crystallization point of the sugar component, and warming it to a temperature at which sugar crystallizes out in the form of fine crystals. The mass is then dried at a temperature less than the solution point of said sugar crystals to prevent liquefying the dispersed crystals.

Digest from U. S. Patent 2,451,630, issued Oct. 19, 1948, on an application dated Sept. 18, 1945, to E. F. McGee, Wayland, Mass.

Coating Confections

An apparatus for coating frozen confections with shredded, granulated or powdered coatings has recently been patented. Apparatus comprises a rack and a rotatable drum with motor attached. The rack has a plurality of retainers for releasably holding the sticks of the confections. On the inner surface of the drum's peripheral wall are a number of shelves. One end wall of the drum has an aperture through which the confections extend into the drum when the rack is fastened to this wall.

In operation the desired coating material is placed upon the shelves in the drum. Confections are frozen and defrosted from molds in a conventional manner, then dipped into peanut oil, or some other suitable binder. The rack is quickly secured to the wall of the

(Continued)

DARNELL
CASTERS & WHEELS

• Save Money, Floors, Equipment

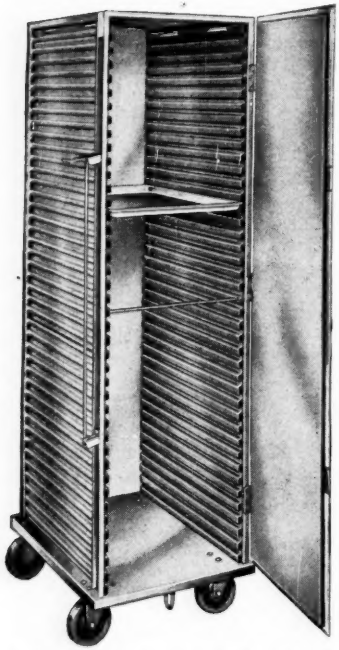
For light or heavy duty service Darnell Casters and Wheels are made for a long life of trouble-free usage, to protect floors and increase employee efficiency.

DARNELL CORP. LTD. 60 WALKER ST., NEW YORK 13, N.Y.
LONG BEACH 4, CALIFORNIA 36 N. CLINTON, CHICAGO 6, ILL.

OTHER BAKERS have already proved, and you can too, that the high cost of handling bakery products from oven to store can be greatly reduced. **CRESCENT CABINETS** are light—yet sturdy, and carry a large volume (41 pans). The whole truckload goes farther at lower cost.

Employees are happier because their work is lighter. **WOMEN** handle units easily. **ONE MAN** per truck makes deliveries.

You take the **RED INK** out of handling costs when you deliver your baked goods in Crescent Cabinets. Check these Crescent advantages against any other system.



- **All pans fit—whether old or new**
- **Only one man on each delivery truck**
- **Eliminate 1 truck in each 4**
- **Save all expenses of 4th truck**
- **60% less product breakage**
- **Shorter delivery stops**
- **Easy to clean and keep clean**
- **Easily handled loaded by women**

Loading Cabinet

Unloading Truck

"41" Holds 41 bun pans. Height 69 ¾". Net Wt. 105 lbs. **"33"** Holds 33 bun pans. Height 57 ¾". Net Wt. 99 lbs.

Prepare for the future with its keener competition, lower prices, and narrower margins by taking the **RED INK** out of handling costs. For greater profits tomorrow, write, wire, or phone us today.

CRESCENT METAL PRODUCTS INC.
18901 ST. CLAIR AVENUE • CLEVELAND 10, OHIO

drum, and the motor is started, causing drum to rotate.

During rotation, particles of coating material are carried upward by the shelves and fall onto the confections. After a predetermined revolution of the drum, the motor is suddenly stopped. This quick stop causes the excess coating material to be shaken off, leaving only a layer adjacent to the frozen surface of the pop. Rack is now removed and the pops are released and bagged by conventional methods.

Digest from U. S. Patent 2,450,661, issued Oct. 5, 1948, on an application dated June 4, 1948, to J. G. Herrmann, Baldwin, N. Y., and assigned to Conveyor & Machinery Mfrs., Inc. New York City.

FERMENTATION

Yeast Production

Yeast for feeding is produced as a byproduct—brewers' yeast—or as the principal product in primary yeast manufacturing. Cultures are selected according to the end-product desired—flavor, vitamin content, protein value or non-protein content—and also according to their rate of growth and yield, cell size and density, stability of characteristics and resistance to autolysis.

The methods of maintaining cultures include the use of agar slants, 10 percent sucrose solution and lyophilization. Propagation of cultures requires attention to sterility, adequate nutrition of the yeast and acclimatization to temperature, aerobicity and inhibitory substances.

Methods used in primary production depend on the type of raw materials available. Polysaccharides must be hydrolyzed, insoluble matter removed, additional nutrients may be required. Aeration may be either coarse or fine. Rate of addition of nutrients, pH and temperature must be controlled. Yeast may be finally separated by centrifugation and dried on a drum or in spray drying equipment.

Digest from "Basic Principles of Culturing and Production," a paper by L. Atkin, presented at Yeast Symposium, Milwaukee, Wis., Nov. 8-10, 1948.

VITAMINS

Losses of Vitamin C In Stored Potatoes

Absorption of moisture from humid air increases the tendency to form sprouts and uses up some of the vitamin C in potatoes. That this accounts for the steady diminution of vitamin C in potatoes during autumn and winter was indicated by experiments per-

formed in England, at Cheltenham.

Potatoes used were stored in an experimental clamp (covered heap), samples being withdrawn at regular intervals for testing. After the usual drop in autumn, the average vitamin C content became steady in three samples taken during Nov. and Dec., but fell again in Jan., Feb. and March. Daily records of maximum and minimum temperatures in the clamp did not provide a satisfactory explanation for the losses.

Rainfall records showed that there was very little rain during Nov. and Dec. when the vitamin C content remained constant. Much more rain fell in Jan. and Feb. when the vitamin C decreased. As a further test, potatoes which had been taken from the clamp in early Jan. and stored in a dry shed to be used for seed, were examined in April. Their vitamin C content was significantly higher than in similar potatoes stored in the clamp during the same period—for example 13.9 ± 0.4, as compared with 7.7 ± 0.4 mg. per 100g.

Digest from "Vitamin C in Potatoes," by Frank Wokes and Gordon Nunn, *Nature*, 900-01, Dec. 4, 1948.

MEAT AND FISH

Swordfish Composition

Essential amino acids, present in swordfish in amounts very similar to those present in beef, are not significantly affected by canning or broiling. Dehydration produces significant losses. Good retention of vitamin A, riboflavin and nicotinic acid, was observed after dehydration, canning and broiling, but low retention of thiamin and biotin.

In a series of experiments with swordfish, samples of which were frozen, dehydrated, canned and broiled, then stored at -0.4 deg. F., the contents of arginine, isoleucine, histidine, leucine, lysine, methionine, phenylalanine, threonine, tryptophane and valine showed little change in the frozen, canned and broiled samples. All the 10 amino acids were reduced by dehydration, 8 of them significantly.

Determinations of vitamins were also made from portions of the above samples. Vitamin A content of the dehydrated swordfish was low, probably due to oxidation during dehydration and storage. Extremely high values in the broiled sample were not explained. The canned fish retained approximately the same amount of vitamin A as the frozen sample. The dehydrated and broiled fish showed large losses of thiamin and the canned samples even larger. For better reten-

(Continued)

chosen for extra strength and positive tightness!

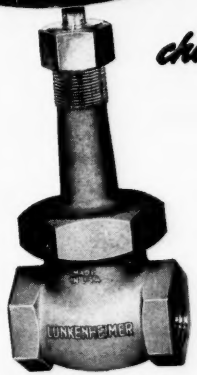


FIG. 2228 SCREW ENDS
FIG. 2229 FLANGE ENDS
Double disc, rising stem

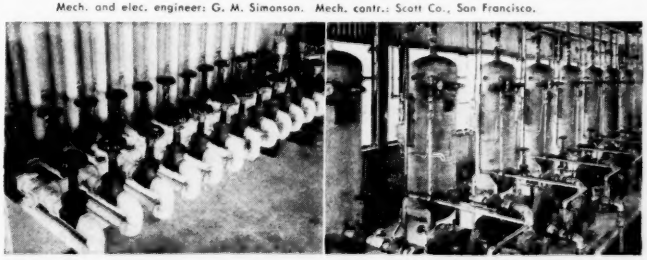
THE accompanying views in the modern paint manufacturing plant of W. P. Fuller & Co., show the application of hundreds of Fig. 2228 valves on solvent processing operations. LUNKENHEIMER Fig. 2228 carries a pressure rating of 200 lbs. steam (400 lbs. water, oil and gas) making the valve suitable for a wide range of power plant uses as well as industrial services.

These valves, selected for plants from coast to coast, embody traditional LUNKENHEIMER quality, assure longer valve service, lower operating costs and greater dependability. The same advantages are available *and* important to you. Write for details today.

YOUR LUNKENHEIMER DISTRIBUTOR will gladly show you how this valve's extra strength means extra service, extra value too! Ask for Circular 534 or write direct.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO, U. S. A.
NEW YORK 13 CHICAGO 6
BOSTON 10 PHILADELPHIA 34
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

Views in modern plant of W. P. Fuller & Co., pioneer western paint mfrs., San Francisco, Cal. Mech. and elec. engineer: G. M. Simonson. Mech. contr.: Scott Co., San Francisco.



Put *accurate* Toledo Scales on the job every step of the way in your plant . . . for *closer control* of costs and quality! Toledos stop costly errors . . . save time by making each weighing operation quick and sure. For better control in weighing, checking, testing, counting, batching, force-measuring . . . let Toledo help you. Send for new bulletin No. 2020. Toledo Scale Company, Toledo 12, Ohio.

Send for this

TOLEDO

HEADQUARTERS FOR SCALES

tion of this vitamin, it is suggested that the fish be acidified before canning.

The canned fish showed no significant losses of riboflavin, the dehydrated samples showed an apparent increase, and the broiled swordfish showed a serious loss. The dehydrated and broiled fish did not show significant changes in nicotinic acid, and the canned samples showed a 168 percent retention. Retention of biotin was high in the canned swordfish, small in the broiled sample, and almost nil in the dehydrated sample.

Digest from "Composition and Nutritive Value of Fresh, Cooked and Processed Swordfish," by A. Lopez-Matas and C. R. Fellers, *Food Research*, 387-96, Sept.-Oct. 1948.

MISCELLANEOUS

Mechanism in Fungicides

According to one theory of the way in which protective sprays kill fungi, these microscopic parasites commit suicide by poisoning themselves. Fungicides are usually applied to healthy plants and seeds to protect them against infection. Inasmuch as they are usually applied in a water-insoluble form, the question arises as to how such relatively insoluble materials can exert their protective action. In Bordeaux mixture, for example, the copper mysteriously "disappears" in the solution, and it is believed that the fungus spores bring it into solution by their own secretions and thus poison themselves. In support of this theory, recent work has shown the presence of hydroxy and amino acids that can form toxic copper complexes. In the case of sulphur fungicides, the eventual deposit of which is finely divided sulphur particles, it has been shown that fungus spores are able to reduce sulphur vapor to hydrogen sulphide, which is toxic and kills the spores. Sulphur-resistant spores are relatively inactive in producing hydrogen sulphide, but if sulphur-sensitive spores are also present, they may produce enough hydrogen sulphide to kill the resistant ones.

Digest from a paper presented by S. A. E. McCallan at the 114th national meeting of the American Chemical Society, Washington, D. C., Aug. 30, 1948.

Fumigant Absorption

Food products and seeds, when subjected to fumigation to destroy pests, absorb the fumigant in amounts depending on the kind of fumigant, and the nature and physical condition of the material. The absorption has been observed with four fumigants (hydrogen cyanide, ethylene oxide, trichloroacetonitrile, and methyl bromide),

using five test materials (wheat, soy beans, raisins, peanuts and onion seed).

Wheat absorbs HCN to the greatest degree, and CH_3Br the least, both as to rate and total amount. Peanuts absorb all fumigants about equally in total amount, but trichloroacetonitrile far more rapidly than the others. Rate of absorption is strikingly affected by the moisture content—materials of high moisture absorbing fumigants much faster than those of low moisture.

Oily seeds absorb both oil-soluble and water-soluble fumigants strongly. If there is a specific chemical action between the fumigant and a constituent of the material, absorption may be abnormally high. This may occur, for example, between CH_3Br and the di- and tri-sulphides of onion seed.

Wheat was the least absorbent material tested, but the wheat fractions differed in their ability to absorb the different fumigants. All fractions absorbed HCN about equally. Bran and germ absorbed ethylene oxide and trichloroacetonitrile vigorously. CH_3Br was the least absorbed of the four fumigants, but a smaller proportion was desorbed by airing following fumigation, indicating considerable chemical action. Flour and meal gave up HCN more completely on airing than other fumigants. Increasing the temperature increased the amount of methyl bromide permanently absorbed by wheat meal.

Germination of onion seed of 13 percent moisture, after exposure to 780 mg. of CH_3Br per l. of air at 50-59 deg. F., was satisfactory. For temperatures of 68 deg., moisture should be 12 percent or less; for 86 deg., 11 percent or less.

When seed is sacked and placed in a fumigation chamber, an appreciable time elapses before the concentrations of fumigant at the center of the sack and in the free space around the sack equalize. For 100-lb. sacks of onion seed at 50 deg. F., 3-4 hr. were necessary. If the moisture content is high (18 percent), the fumigant concentration in the free air space may fall for several hours as fumigant is absorbed. Sacks of dry seed come to equilibrium more rapidly. Both the loading of seed in the chamber and its moisture content must be taken into account in determining the dosage of fumigant necessary for the proper concentration-time product that will rid the material of the pests which are being exterminated.

Digest from "Determination of Fumigants. XIX. Sorption of Methyl Bromide by Onion Seed", by O. F. Lubatti and B. Smith, JOURNAL OF THE SOCIETY OF CHEMICAL INDUSTRY, Vol. 67, 297-309; and "Fumigation of Agricultural Products. I. A. Fumigation Chamber for Onion Seeds" by O. F. Lubatti, John Russell and J. S. Porter, ibid. 309-13, Aug. 1948.

A TYPICAL "GEYER" FILLING MACHINE INSTALLATION

GEYER
SINCE 1914

SHOWN IN OPERATION A "Geyer" Preserve and Jelly Filling Machine.

Fine

FILLING MACHINES FOR DIVERSIFIED NEEDS

FILLING MACHINES FOR

JAMS	GREASE
SYRUP	LACQUER
JELLIES	MAYONNAISE
CHEESE	PEANUT BUTTER
GLUE	APPLE BUTTER
PASTE	VANISHING CREAM

AND SIMILAR PRODUCTS

"GEYER" Filling Machines are versatile, durable and adaptable to innumerable packaging requirements. All have these features:

MULTIPLE FILLING • MINIMUM WEAR • VARIETY OF MACHINE SIZES • HIGH QUALITY WORKMANSHIP • POSITIVE PISTON DISPLACEMENT • HIGH OPERATING EFFICIENCY • FULL AUTOMATIC OPERATION.

Under critical operating conditions there is no drip, machines are clean filling, and readily adjustable to any size or shape container. Maximum production output assured.

CHECK THESE REPRESENTATIVES

NEW YORK (7) Charles F. Adams, 30 Church St.
BOSTON (16) Salleck & Newbert Inc. 131 State St.
CHICAGO (4) Clyde E. Austin & Son, 53 W. Jackason Blvd.
DENVER (9) Edwin F. DeLine Co., 224 W. Alameda Ave.
SAN FRANCISCO (5) J. B. Bellamy & Co., 111 Main St.

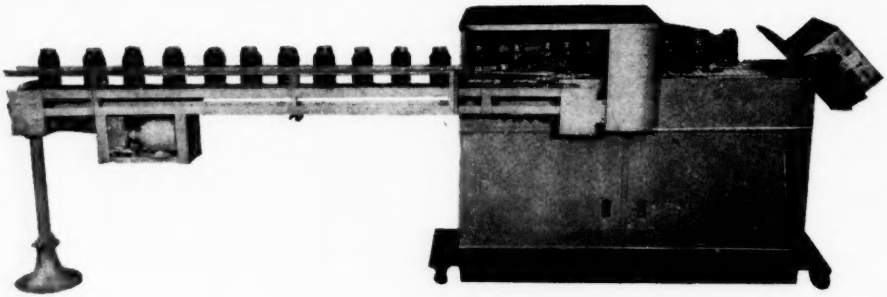
SEND FOR OUR LATEST CATALOG.

THE FILLER MACHINE CO. INC.

1248 E. Montgomery Avenue, Philadelphia 25, Pa.

Styl-O-Matic

STRAIGHTLINE UNSCRAMBLING TABLES



A few of the many types and sizes of containers Unscrambled on the Styl-O-Matic

Cut Your Costs—Increase Production

MORE SPEED—Unloads 60 to 240 units per minute or more
MORE SANITATION—Eliminates handling the mouth of jars or bottles
LESS BREAKAGE—Almost complete elimination of breakage which formerly occurred when bottles were transferred from carton to conveyor by hand

OUR NEAREST AGENT CAN CALL—OR SEND FOR BULLETIN F-26

ISLAND EQUIPMENT CORPORATION

27-01 Bridge Plaza North **Long Island City 1, N. Y.**

Books

Chemistry and Microbiology

ADVANCES IN PROTEIN CHEMISTRY, *Vol. IV. Edited by M. L. Anson and John T. Edsall. Published by Academic Press, Inc., 125 E. 23rd St., New York City, 1948. 575 pages; 6¼x9¼ in.; cloth. Price, $8.50.*

ANNUAL REVIEW OF MICROBIOLOGY. *Vol. II. Edited by Charles E. Clifton, Sydney Raffel and H. Albert Barker. Published by Annual Reviews, Inc., Stanford, Calif., 1948. 532 pages; 6¼x9 in.; cloth. Price, $6.*

These two books carry on the work established by their earlier editions. Papers under the first mentioned title, which should be of value to the food chemist, are: Protein Gels, by John D. Ferry; The Interactions of Proteins and Synthetic Detergents, by Frank W. Putnam; Preparative Electrophoresis and Ionophoresis, by Henry Svensson; Stereochemistry of Amino Acids, by A. Neuberger; and X-Ray Studies of Amino Acids and Paptides, by Robert B. Corey.

The microbiological studies that should interest the food technologist are: Yeasts, by E. M. Mrak and H. J. Phaff; Growth Factors for Microorganisms, by S. A. Koser; Antibiotics, by J. H. Bailey and C. J. Cavallito; Chemical Disinfectants, by O. Wyss; and Microbiology of Drinking Water and Sewage, by J. Smit.

Frozen Food Cookery

THE FROZEN FOOD COOK BOOK. *By Jean I. Simpson and Demetria M. Taylor. Published by Simon & Schuster, Rockefeller Center, New York 20, N. Y., 1948. 493 pages; 5½ x 8¼ in.; cloth. Price, $2.95.*

Publication of this book is something all frozen food packers will want to know about, since it offers some kind of evidence that the industry is approaching maturity. That evidence will be about the limit of their direct interest, however, since there is little in the book that he does not already know.

Written with the technical assistance and cooperation of the Frozen Food Foundation, the book aims at being a complete consumer guide to the buying, preparation, and cooking of packaged foods, and the home freezing of fresh foods. Practically all quick frozen types of food are considered—meats, poultry, fish and shellfish, vegetables, fruits, fruit juices and prepared foods.

In addition, there are about 400 recipes and 800 menus, along with charts and directions for storing, defrosting and precooking preparation of all frozen foods.

At any rate, it is a book that the frozen food producer will be glad to recommend.

British Review

INDEX TO THE LITERATURE OF FOOD INVESTIGATION. *Vol. 17, No. 1, June, 1945. Compiled by Agnes Elisabeth Glennie. Published by Department of Scientific & Industrial Research, 1948. 103 pages; 6 x 9½ in.; paper. For sale through His Majesty's Stationery Office, York House, Kingsway, London W. C. 2. Price, 6s.*

Set back by the War, these reviews of food literature in Great Britain continue to be welcome, though still very late.

Plain Language Refrigeration

BASIC REFRIGERATION AND AIR CONDITIONING. *By Robert Henderson Emerick. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York, N. Y., 1948. 259 pages; 6¼ x 9¼ in.; cloth. Price, $5.00.*

This is a non-technical book that might prove useful in the food plant. It is written, primarily, to acquaint men of various trades with the nomenclature of the field. The work was originally developed to train a large force of pipefitters, machinists, planners and estimators, who were called upon to install and repair work on refrigeration and air conditioning machinery at Pearl Harbor, during World War II.

The original job has been carefully revised in this volume. It now offers a comprehensive treatment of all phases of the subject, including consideration of the most commonly used refrigerants and systems.

Government Publications

THE QUALITY OF WATER FOR IRRIGATION USE. *By L. V. Wilcox. U. S. Department of Agriculture Technical Bulletin No. 962. Price 15c.* Deals primarily with irrigation water, but is also helpful in appraisal of quality of water for factory use.

FAO BULLETIN. *Individual copies available from Director of Information, FAO, 1201 Connecticut Avenue N. W., Washington 6, D. C.* This is a periodic document issued by Food

(News Continued)

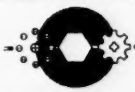
So Tasty—but HOW GOOD?

Food enrichment to enhance the nutritional value is frequently vital to win and retain consumer acceptance. Retention of natural elements and vitamins is essential.

Our unexcelled staff of experts in Chemistry, Physics, Bacteriology, Toxicology, Engineering and Practical Market Research is at your service. Improving your products—their processing and packaging—can increase your "profits production".

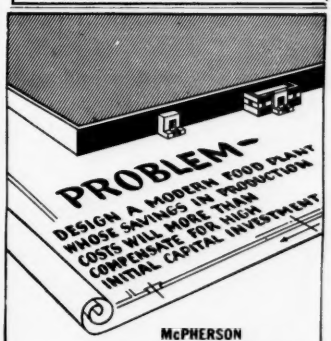
For an insight as to how we can effectively serve you, send for your free copy of "The Chemical Consultant and Your Business".

FOSTER D. SNELL, INC.



Chemists Engineers

29 W. 15 St. New York 11, N.Y. WA 4-8800


PROBLEM—
DESIGN A MODERN FOOD PLANT WHOSE SAVINGS IN PRODUCTION COSTS WILL MORE THAN COMPENSATE FOR HIGH INITIAL CAPITAL INVESTMENT

McPHERSON ADVANCED ENGINEERING SOLVES THIS PROBLEM

COMPLETE PLANT DESIGNS

Plant Site Investigations
Labor Saving Studies
Process Analysis
Appraisals
Plans
Research and Reports
Industrial Surveys
Valuation

Write for an analysis of your particular problem. No obligation.

The McPherson Co. Greenville, S. C.
Engineers · Architects

UNITED CARTONS, STURDY, STRONG—
PROTECT YOUR PRODUCT WELL AND LONG.
WHEN SHOPPERS SEE IT, PASSING BY,
THEY SAY, "THIS IS THE BRAND I'LL TRY!"

Shoppers reach for your brand—when it's packaged in a colorful, modern carton by United!

And shoppers *identify* your brand instantly—thanks to United's ability to make every package *distinctive* as well as eye-catching! Add the qualities of sturdiness and full flavor protection . . . and you'll know why United cartons assure you speedy turnover, repeat sales.

Planning a new package? Want a dependable source of supply for your established design? Just call on United! Our engineers and artists will gladly work with you to develop the ideal carton, tray or U-board for your needs. No extra cost—so write United today!

UNITED BOARD & CARTON Corporation

Folding Cartons and Paper Specialties • FROM PULP TO FINISHED PRODUCT

P. O. BOX 1318 • SYRACUSE, N. Y.

BOARD MILLS
Lockport, N. Y., Thomson, N. Y., Urbana, O.

CARTON PLANTS
Victory Mills, N. Y., Syracuse, N. Y., Brooklyn, N. Y., Cohoes, N. Y., Springfield, O.

& Agriculture Organization of the United Nations. The November 1948 issue, Volume III, No. 4, gives a resume of the makeup, activities, and program of FAO with reference to 1949 activities.

FRUIT AND VEGETABLE SHIPMENTS. *Unnumbered booklets issued by Market News Division of Production & Marketing Administration.* Latest available data covering calendar year 1947 for: (a) Carlot Unloads of Certain Fruits and Vegetables in 100 Cities and Imports in 5 Cities for Canada, and (b) Carlot Shipments of Fruits and Vegetables by Commodities, Counties and Stations including Boat Shipments Reduced to Carlot Equivalents.

SOURCE OF NEW PRODUCT POSSIBILITIES FOR MANUFACTURERS. *U. S. Department of Commerce, Office of Domestic Commerce. Price 25c.* A partial listing of patents available for food machinery, equipment, devices, products and processes.

PREPACKAGING FRUITS AND VEGETABLES BY COOPERATIVES. *By Oscar R. LeBeau. U. S. Department of Agriculture, Miscellaneous Report* 126. *Available from Farm Credit Administration. Mimeographed.* A brief discussion of prepackaging methods and their economic market opportunity.

AGRICULTURAL OUTLOOK CHARTS. *Bureau of Agricultural Economics. Unnumbered booklet. Price* 45c. Includes tabular and graphic presentation of data for all crops and animal products covered by BAE inquiries. In many cases, 1949 forecasts are given.

CITRUS FRUITS. *Unnumbered mimeographed leaflet. Bureau of Agricultural Economics.* Gives "acreage, production, farm disposition, value and utilization of sales for crop seasons 1946-47 and 1947-48."

PREPARATION AND USE OF LEAF MEALS FROM VEGETABLE WASTES. *By J. J. Willaman and Roderick K. Eskew. Bureau of Agricultural & Industrial Chemistry, Technical Bulletin No.* 958. *Price,* 35c. Report on investigations conducted largely on leafy wastes of vegetables grown in the Middle Atlantic States.

The above recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, *D. C. When no price is indicated, the pamphlet is free and should be ordered from the Bureau responsible for its issue.*

Patents

Yeast Grown in Sugar-Containing Nutrient Medium by Systematic Periodic Addition and Removal Until No Sugar Remains in Nutrient—Firmin Boinot, Melle, and Jean Boige, La Noblette-Melle, France to Les Usines de Melle, Saint-Legerles-Melle, France. No. 2,446,737. Aug. 10, 1948.

Egg Meats Mixed With Propylene Ester of Higher Fatty Acid Preparatory to Drying—C. N. Frey, Scarsdale, and G. E. Miller, Bronx, N. Y. to Standard Brands Inc., New York City. No. 2,447,063. Aug. 17, 1948.

Cakes and Like Baked in Plurality of Spaced Pans of Circular Periphery Arranged in Rows in Fixed Relation to Each Other—J. Kollman to Ekco Products Co., Chicago. No. 2,447,126. Aug. 17, 1948.

Nut-Butters of Full-Bodied Flavor Made by Introducing Flavor Solvent Into Comminuted Mass of Nuts in Presence of Dineric Interface Modifier—F. L. Avera, Laguna Beach, and J. L. Rosefield, Oakland, Cal.; Avera to Rosefield, No. 2,447,387. Aug. 17, 1948.

Ground Raw Meat Mixed With Quantity of Egg White and Lesser Quantity of Egg Yolk to Retain Fresh Color and Resist Bacterial and Enzymatic Decomposition During Storage Under Refrigerated Conditions—E. N. Oftedahl, Chicago. No. 2,447,427. Aug. 17, 1948.

Tryptophane Synthesized—H. R. Snyder, Urbana, Ill., E. E. Howe, Liden, and A. J. Zambito, Rahway, N. J., to Merck & Co. Inc., Rahway, N. J. No. 2,447,544. Aug. 24, 1948.

Fruit-Flavored, Stable Jelly Made From Sugar-Cane, Sugar-Beet or Sorghum Juice, Pectin and Food Acid—A. M. Zenzes, New York City. One-Half to Musher Foundation, Inc., New York City. No. 2,447,550. Aug. 24, 1948.

Pears Mechanically Positioned, Peeled, Halved and Cored—G. A. Dunn, Oakland, Cal., to California Packing Corp., San Francisco. No. 2,447,640. Aug. 24, 1948.

Lecithin Interspersed and Suspended in Dry Irish Moss—W. J. Allingham, Denver. No. 2,447,726. Aug. 24, 1948.

Fatty Material Extracted With Liquid Solvent Flowing Counter to Material in Transversely Rounded Bottom Trough Fitted With Co-acting Rotary Feed Screw—C. F. Dinley, to Detroit Rex Products Co., Detroit. No. 2,447,845. Aug. 24, 1948.

Prolamines Separated From Cereal Protein by Hot Acid Hydrolysis while in Contact with Alkali Metal Hydroxide in Water Solution—L. O. G. Pearce, Hammond, Ind., to American Maize-Products Co. No. 2,448,002. Aug. 24, 1948.

Concentrated Apple Juice Used to Modify Milk—Huston St. Clair, Tazewell, Va., to Ridgewood Inc., Winchester, Va. No. 2,450,456. Oct. 5, 1948.

Cooking Time of Macaroni, Spaghetti, and Like, Controlled by Addition of 1 to 5 Percent of Such Colloids as Pectin, Algin, and Gelatin to Semolina Flour—Rene Samson, Montreal, Quebec, Canada No. 2,450,525. Oct. 5, 1948.

Vegetable Oils Decolorization Aided by Use of Hydrated Magnesium Silicate Treated With Solution of Water-Soluble Ferric Salt—Alexander Greentree, Paulsboro, N. J., to Lyle Caldwell, Los Angeles, Calif. No. 2,450,549. Oct. 5, 1948.

Cellulose Content of Plant Tissue Converted to Sugar by Successive Progressive Stages of Saccharifying—J. W. Dunning and E. C. Lathrop, Peoria, Ill., to United States of America. No. 2,450,586. Oct. 5, 1948.

Plasmolyzed Brewer's Yeast Freed of Undesirable Flavoring Constituents by Treatment With High Molecular Weight Fatty-Acid Partial Ester of Aliphatic Polyhydroxy Material—Ben Maizel, to Vico Products Co., Chicago. No. 2,450,604. Oct. 5, 1948.

Shell Eggs Cleaned by Mechanically Applied Abrasive—Edward T. Molitor, Seattle. No. 2,450,606. Oct. 5, 1948.

Foods Frozen Under Vacuum in Unit Having Blanching Zone Interconnected With Freezing Zone; Both Zones Valved to Obtain and Maintain Vacuum—Frank B. Doyle, Phillipsburg, N. J., to Ingersoll-Rand Co., New York City. No. 2,450,645. Oct. 5, 1948.

Confections Mechanically Coated With Decorative Solid Particles—J. G. Herrmann, Baldwin, N. Y., to Conveyor & Machinery Manufacturers, Inc., New York City. No. 2,405,661. Oct. 5, 1948.

(Continued)

MONOSODIUM GLUTAMATE
Hydrolyzed VEGETABLE Protein
These derivatives of wheat protein are being used by many food manufacturers to
IMPROVE FLAVORS IN FOODS
Write for descriptive literature and samples
THE HURON MILLING COMPANY
9 PARK PLACE NEW YORK CITY 7
In Business Over 70 Years

So you think **HE'S** *fast!*

Just because a guy can run 100 yards in less than 10 seconds, you compare him to a flash of lightning. Listen a minute, while we tell you about a *salt* that's fast . . . and why it's important to you.

In salting butter, salt must dissolve with lightning speed. If the butter is on the soft side, butter salt must dissolve so quickly that overworking is avoided. Otherwise, the butter may become mottled or marbled, lose its moisture, become leaky. Yet, if the salt is not properly dissolved, the butter may be gritty. So, remember that Diamond Crystal Butter Salt dissolves completely in water at 65° F. at an average rate of 9.2 seconds.

On the other hand, there are instances where slow solubility of salt is highly important . . . such as in salting cheese. Here slow solubility prevents salt being lost in whey, producing undersalted cheese. To meet *all* these problems, we have set up definite solubility standards for Diamond Crystal Salt.

Need Help? Write for it!

If salt solubility enters into your processing, write to our Technical Director. He'll gladly recommend the correct grade and grain of Diamond Crystal Salt for best results. Diamond Crystal, Dept. J-15. St. Clair, Michigan.

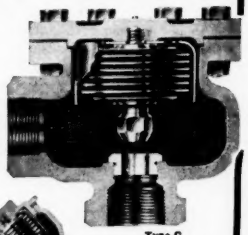
DIAMOND CRYSTAL
Alwayer PROCESS SALT

Nicholson Steam Traps Show

PRODUCTION INCREASES UP TO 30%

2 to 6 Times More Drainage Capacity Speeds Circulation

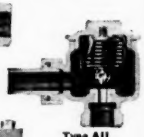
Plant records show that the greater drainage capacity of Nicholson thermostatic steam traps increases production up to 30%.



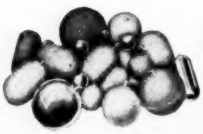
Type C

Other reasons why an increasing number of leading plants are standardizing on Nicholson: operate on lowest temperature differential, 5° to 15°, depending on trap size and steam pressure; record low for steam waste (as low as 1%). 5 types for every purpose; size ¼" to 2"; press. to 225 lb. BULLETIN 1047.

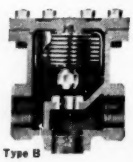
Type AHV



Type AU



HIGH - PRESSURE FLOATS —Stainless, monel, steel or plated steel. Welded. In all sizes and shapes; for operating mechanisms and as tanks or vessels. 2-day delivery BULLETIN 348.

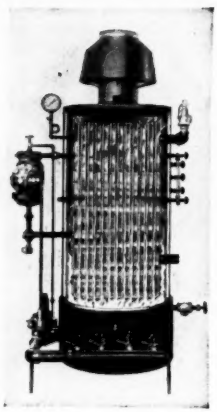


Type B

Type A

W. H. NICHOLSON & CO., 193 Oregon St., Wilkes-Barre, Pa.

EVERY UNIT AN *"individual"* UNIT



The KANE Boiler is built to A.S.M.E. specifications, in sizes to 30 H.P.

the KANE BOILER PACKAGE

Each KANE BOILER PACKAGE is carefully considered by us as an "individual" job—from the customer's requirements to the finished unit. And each BOILER PACKAGE is a compact, self-contained steam source that includes: the correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

Engineered Steam at its best, with four decades of experience at your disposal—so, send your steam problem to us for study and recommendation.

ENGINEERED STEAM AT ITS BEST

MEARS-KANE-OFELDT INC.

1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA.

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE

—Continued from page 195

Sucrose Solutions Freed of Organic-Acid Impurities by Treatment with Finely Divided Particles of Prefused Clay and Lime Without Appreciable Inversion of Sucrose to Glucose—Ernest E. Pittman, Elizabethtown, Ky. No. 2,450,683. Oct. 5, 1948.

Meat Tenderized by Mechanical Treatment—Grant M. Richard, to Toledo Scale Co., Toledo, Ohio. No. 2,450,688. Oct. 5, 1948.

Milk Sampled During Continuous Flow by Means of Special Valve—Willard S. Campbell, to M & C. Conveyors, Inc., Chicago. No. 2,450,715. Oct. 5, 1948.

Dextrins Recovered From Stillage Sirup—Harold W. Coles, Rochester, N. Y., to Joseph E. Seagram & Sons, Inc., Shively, Ky. No. 2,450,717. Oct. 5, 1948.

Fruit Juices, Beverages, Extracts and Infusions Concentrated By Flowing Rapidly in Thin Film Over Heat-Exchange Surface Under High Vacuum With Recovery of Volatile Flavor-Producing Ingredients For Restoration to Concentrates—George G. Zahm, Buffalo, N. Y., to Hurd Corp., New York City. No. 2,450,744. Oct. 5, 1948.

Whole Fresh Egg Meats Concentrated by Passing Through Evacuated Chamber at Relatively High Rate and in Relatively Thin Continuous Film Under Mechanically Applied Pressure—George G. Zahm, Buffalo, N. Y., to Hurd Corp., New York City. No. 2,450,775. Oct. 5, 1948.

Proteins Recovered From Soy Beans and Peanuts by Use of Water-Soluble Urea Compound in Connection With Dissolving Protein Content in Aqueous Alkaline Solution and Precipitating From Filtered Solution by Acidification—A. V. L. Opper, New York City, and W. P. Horst, Little Silver, N. J., to Virginia Carolina Chemical Corp. Richmond, Va. No. 2,450,810. Oct. 5, 1948.

Cheese Made From Milk Containing Proteolytic Enzyme Substance in Inactive State But Capable of Developing Cheese Body Characteristics—Z. D. Roundy and H. L. Keil, Clarendon Hills, Ill., to Armour and Company, Chicago. No. 2,450,814. Oct. 5, 1948.

Vegetable Oils Extracted Continuously During Vertical Movement of Fat-Containing Material Through Solvent in Perforated Buckets—Lester L. Ford, Eufaula, Ala. No. 2,451,081. Oct. 12, 1948.

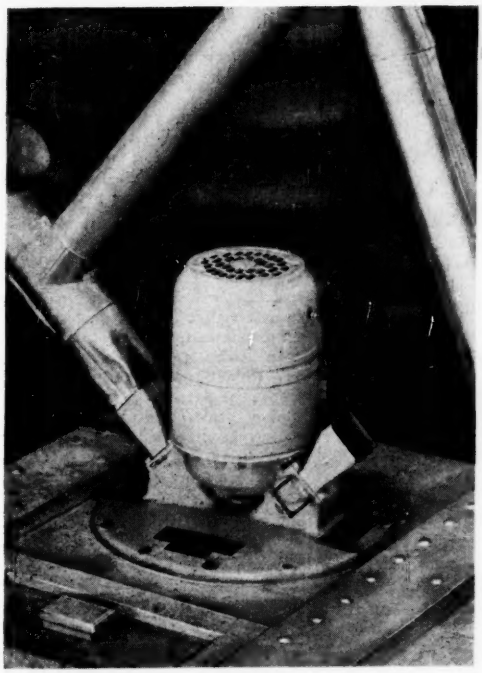
Popcorn Coated With Melted Caramel, Sprayed With Shortening Containing Lecithin to Overcome Stickiness and Avoid Formation of Aggregates and Agitated During Cooling by Air Currents—Jacob J. Kooman, to Confections, Inc., Chicago. No. 2,451,096. Oct. 12, 1948.

Water-Soluble Pure Egg Albumin Obtained From Egg-Shell Drainings by Treatment With Water Insoluble Terpineols—Frederick F. Pollak, New York City. No. 2,451,116. Oct. 12, 1948.

Sugar Solution Passed Through Anion-Active Resin for Removal of Anion Impurity Followed by Reactivation of Resins by Washing With 0.1 to 20.0 Percent Strong Acid Solution and With Alkali—William A. Blann, Stamford, Conn., to American Cyanamid Co., New York City. No. 2,451,272. Oct. 12, 1948.

Printed copies of patents are obtainable, at a cost of 25¢ each, directly from U. S. Patent Office, Washington, D. C.

Continuous Insect Control for Food Plants



This "ENTOLETER" Centrifugal Machine protects doughnut mix ahead of packing

THE BEST WAY to safeguard food products and ingredients from insect infestation is to have the continuous protection of "ENTOLETER" Insect Control.

Insect control, to be truly effective, must be a continuous process . . . it must destroy all stages of insect life in free flowing dry materials: eggs, larvae, pupae and adults. This is an important advantage of the "ENTOLETER" System. Simply installed, its mechanical action gives a complete and continuous kill.

"ENTOLETER" Control protects incoming materials, materials before and after storage, and your finished products before packaging. By destroying all insect life, the threat of insect multiplication is eliminated, and food materials are protected from adulteration by insect excreta.

NEW BULLETIN describes important applications for "ENTOLETER" Centrifugal Machines. Whether or not you now have "ENTOLETER" equipment, you can benefit from the information in this folder. Send for your copy today.

Foreign distributors
HENRY SIMON LTD., STOCKPORT, ENGLAND

ENTOLETER
CENTRIFUGAL MACHINES

CONTINUOUS INSECT CONTROL SYSTEM

ENTOLETER DIVISION

The Safety Car Heating and Lighting Co., Inc.
P.O. Box 904, New Haven 4, Conn.

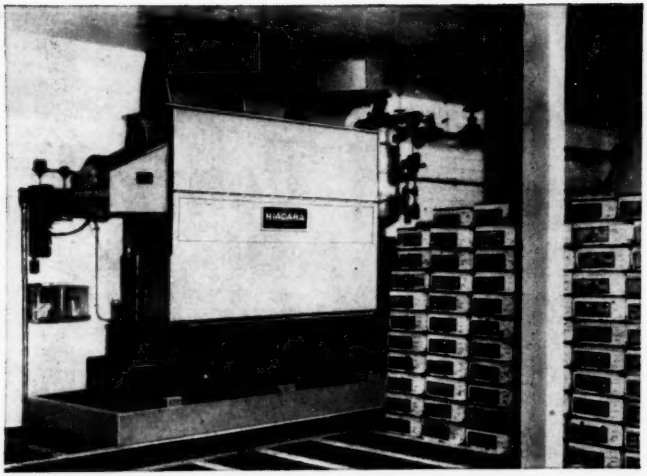
Send full information on "ENTOLETER" Continuous Insect Control System.

Name .....

Company .....

Address .....

City, Zone and State .....



TEMPERATURES NEVER RISE... with NIAGARA "NO-FROST"

● With the Niagara "No-Frost" Method, your refrigerating operation is never interrupted for defrosting since at no time is there ever any accumulation of ice or frost on the coils of the Niagara "No-Frost" Spray Cooler.

If you are *pre-cooling*, the full capacity is always there to handle the "live load" and you get quicker chilling of your product to the core with no rise in temperature at any time. If you are *freezing*, the process is continuous and faster, and you get more production. If you are *holding* fresh or frozen food, there is never any temperature rise to endanger the quality.

The Niagara "No-Frost" Method saves money in its operation. A user recently said: "We added a new freezing room to our plant without any additional cost for power". This was accomplished because the Niagara Aeropass Condenser held the head pressure down to the minimum for the entire plant, while the Niagara "No-Frost" Spray Cooler operated at higher suction pressure.

Write for Niagara "No-Frost" Bulletin 105 and details of operation for the type of refrigeration in which you are interested.

NIAGARA BLOWER COMPANY

Over 35 Years of Service in Industrial Air Engineering

Dept. F. I., 405 Lexington Ave. New York 17, N.Y.

District Engineers in Principal Cities

INDUSTRIAL COOLING HEATING • DRYING

NIAGARA

HUMIDIFYING • AIR ENGINEERING EQUIPMENT

New Court Rulings

—Continued from page 107

According to a recent higher court, all manufacturers of food must use reasonable care to keep the floors clean and in safe condition. Failure to remedy a dangerous condition, may result in damage liability.

In Hewitt *v.* Katz Co., Inc [199 S. W. (2d) 872], the testimony showed that a woman visitor slipped, fell, and was severely injured. She sued for damages. The testimony proved that she had stepped into a pile of melted ice cream. The manager of the department stated that he had told the porter to clean it up an hour before that, and he "supposed" that it had been done.

In view of this testimony the higher court awarded the patron $1,250 damages, and said: ". . . there were slippery substances on the floor and the premises for that reason were not reasonably safe. . . "

Fishing Equipment

Decision of a late higher court is that the term "production" means a transformation of raw material into a "change in form."

In Kishman Fish Co. *v.* Glander (17 Ohio Supp. 44), litigation concerned a state law, which provides that no "sales" tax shall be collected on merchandise used for "production" of food products or personal property.

The question was presented to the court as to whether equipment used in the catching of fish for food is exempt from taxation. The higher court held in negative.

Pedestrian Liability

All courts agree that pedestrians and drivers of motor vehicles have an *equal right* to use the streets and highways, and each has a corresponding duty to use ordinary care for personal safety.

In Goodloe *v.* Jo-Mar Daries Co. [185 Pac. (2d) 158], the higher court refused to award a pedestrian damages for an injury sustained when hit by a dairy company's truck while he was crossing a street in the middle of the block and between street intersections.

Where You Can Act

Most of the foregoing rulings relate to the defense of suits that might be brought against you. There are others, however, that indicate where you may institute suits of your own.

You can sue and collect from a warehouseman for damage to perishable goods if you prove that the spoilage resulted from the warehouseman's

lack of efficient refrigeration equipment.

In Scott's Valley Fruit Exchange Co. *v.* Grovers Refrigeration Co. [184 Pac. (2d) 183, reported Nov. 1947], a customer sued a warehouseman for the value of lugs of pears stored in the warehouse. About 1,500 boxes of the pears were completely spoiled, and most other boxes were 75 percent decayed.

The customer proved that the warehouseman had no "standby" equipment in case of emergency, although it was the practice of public refrigeration plants to have sufficient additional machinery to maintain a 25 percent safety factor in excess of ordinary needs.

The warehouseman was held liable for value of the spoiled pears. The court said: "Where a warehouseman undertakes to store fruit, he is bound to maintain his storage rooms at such a temperature as is proper for preserving such fruit."

Also to be noted is Du Quoin Packing Co. *v.* Bonifield [71 N. E. (2d) 173, reported Mar. 1947.] Here, it was shown that a *common carrier*, without refrigeration, accepted skinless sausage for transportation. In holding the carrier liable for value of sausage which "spoiled", the court said:

"It was the duty of defendants (carrier) to provide all suitable means of transportation and to exercise that degree of care which the nature of the property required to protect it from loss and damage . . ."

Taxation With Representation

And did you know that you can have your state pass a valid law taxing sales to obtain money to advertise your product?

In Louisiana State Department of Agriculture *v.* Sibille, [22 So. (2d) 202], it was shown that the State of Louisiana created a "Sweet Potato Advertising Agency." This state law imposes a tax of 1c. per bushel on all sweet potatoes shipped in Louisiana, purpose being to defray expenses of a campaign for advertising and publicizing sweet potatoes and, by that means, promoting their increased consumption.

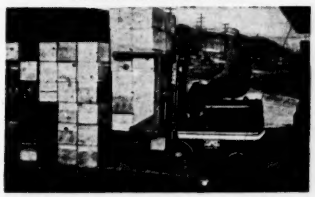
Certain companies contested the validity of the law on the ground that it violated the Constitution in that it illegally taxed commerce transactions. But the higher court refused to agree with this contention. In holding the law valid, the court said: "The statute levies a license tax, not a property tax."

Also of interest is Floyd Fruit Co. *v.* Florida Citrus Commission (128 Fla. 565), wherein there was held valid a state statute, which levies an adver-

MATERIAL HANDLING *News*

Here, for a fact, is . . .

- **Industry's No. 1 handling job . . . that multitude of items weighing 200 to 1000 lbs.**
- **Industry's No. 1 opportunity . . . for substantial savings . . . and**
- **Industry's No. 1 answer . . . the CLARK TRUCLOADER.**



Take fruits and vegetables, for instance, or other perishables—here 24 boxes of apples are handled without pallet by the Trucloader and Clark's Clamp-Lift, designed for that very job, at big savings of time, storage space and handling costs.

Wool and cotton bales, too—here two bales of fine blanket wool are taken by the Trucloader via 3000-lb. elevator to second floor storage; and a once tedious chore is done easily.

Rolls of fabric or paper weighing 450 to 600 pounds each are handled easily by the Trucloader. Damage losses practically ended.

Handling metal parts, setting up machining jobs, hustling castings to storage, replacing dies—there are literally a thousand-and-one jobs for the Trucloader.

Do not these successful applications suggest many ways by which you, too, can realize substantial savings with the Trucloader? This versatile machine can be either gas-powered or electric battery-powered. A practical first step is to CONSULT CLARK.

For helpful reading send for "Material Handling News."

for the CLARK TRUCLOADER *these are naturals*

FRUITS and VEGETABLES *by the box*

or

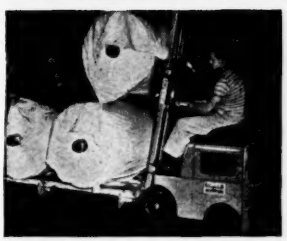
WOOL, COTTON *...by the bale*

or

TEXTILES, PAPER *...by the roll*

or

METAL ITEMS *...by the hundreds*



CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 14, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

J&C ZENITH
CONTINUOUS PULP PRESS
WITH J&C'S NEWEST DEVELOPMENT
"Floating Cone"

JACKSON & CHURCH COMPANY'S ZENITH CONTINUOUS PULP PRESS offers GREATER efficiency and GREATER profits . . . with the hydraulically - operated cake discharge port or "floating cone."

Long the finest dewaterer on the market, Zenith's new 100% automatic operation assures CONSTANT UNIFORM discharge pressure at any pre-determined degree. Finger-tip adjustment assures drier cake of uniform consistency.

These engineering triumphs . . . found only in Zenith Press . . . are available to paper pulp, cannery, corn starch, fish reduction, meat packing, glue, citrus waste drying and many other processes.

For further plant uses for individual problems or for engineering or additional data, write Jackson & Church Company at Saginaw, Michigan.

A PRODUCT OF
JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN
"Work well done since '81"

LA PORTE
FLEXIBLE STEEL
CONVEYOR BELTING
Carries the Load
FASTER · EASIER · CHEAPER

La Porte Flexible Steel Conveyor Belting keeps things moving smoothly and efficiently from bin to shipper. Its porous design permits the circulation of steam and water around products in process. Its strong, resilient construction withstands the impact of loading and will not stretch out of shape . . . slip . . . weave or jump. No special dressings are needed to keep it in shape and it is easily cleaned or sterilized.

Write your Supplier TODAY for La Porte Conveyor Belting. It is available in any length - almost any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

tising tax on each standard-packed box of citrus fruit grown in the State of Florida.

And, in State ex rel. Graham *v.* Enking (59 Idaho, 321), a statute that taxes fruits and vegetables produced in the state for advertising purposes was likewise held valid.

And again in Miller *v.* Michigan State Apple Commission (296 Mich. 248, 296 N. W. 245), the higher court held valid a taxing statute relating to apples grown in the State of Michigan.

In each of these cases the higher court's decision was that the tax is an excise or license tax, not a property tax.

—End—

High Efficiency Attained

—Continued from page 71

transfer rates and makes for a uniform paste.

The first steam-jacketed unit heats the slurry to a predetermined temperature in a matter of seconds, using 255 lb. of steam per hr. at a pressure of 10 psi. Thus, the starch is gelatinized and formed into a paste. In the second unit, the paste is "held" for 15 seconds to insure sufficient cooking. The remaining units quickly cool the paste to stop the cooking action at a definite point, cooling being done in a matter of seconds. In this two-stage cooling arrangement, water (25 gal. per min.) is used in the first unit and ammonia (10 tons of direct expansion ammonia refrigerant) in the second one.

From the cooking and cooling units, the paste flows into two stainless-steel gelling tanks, each holding 500-gal. These tanks permit further gelatinization and hold the paste, ready for the premixers.

Mixing the Dressings

Salad dressing, sandwich spread, and mayonnaise are prepared in the premixers, equipped with turbine-type impellers. In the manufacture of salad dressing, starch paste is pumped by a lobe-type positive displacement pump through a preset recording meter to 125-gal. stainless-steel premixers. Here, too, metered quantities of cooled salad oil are delivered from the oil storage tanks and mixed with eggs, starch paste and combination spice oils.

Mayonnaise and sandwich spreads are also prepared at this point. Starch paste is omitted from the mayonnaise formula, while vegetable relish is added to a mayonnaise base in the manufacture of sandwich spread.

From premixers, dressing products

are continuously discharged by a lobe-type positive displacement pump through a mayonnaise colloid mill. This machine completes the emulsification. It can be regulated so that the size of the oil globules can be altered in the emulsion. Thus, the body and texture of the products can be changed to suit the requirements of the manufacturer.

Packaging Line Is Continuous

Mayonnaise, salad dressing, or sandwich spread then flow continuously to the packaging line. Empty jars are unloaded from cases onto an unscrambler, and the empty cases are stacked at the adjacent packing station. At the filler, a bottle cleaner removes dust that might have accumulated in the jars, previously washed at the jar manufacturing plant. Next, the jars are automatically filled, six at a time. Jars are capped, coded labels are applied, and the jars are then packed into cases. Automatic machines glue and seal the cases, which are loaded onto pallets and finally taken to the finished stock storage area by forklift truck.

—End—

Gasometry

—Continued from page 89

designed and constructed so that it could be easily transported and assembled for use. It consists of a plywood carrying case which contains all equipment and reagents necessary for operation. The case also serves as an apparatus support at the point of assembly.

Variables With Gasometric Method

Data in Table II show that desorption rates are considerably slower for viscous liquids than for water. For this reason, an arbitrary standard sample—not to exceed 100 cc.—should be adopted for the analysis of oils or other viscous products. Sample size limitation is not so critical with aqueous solutions. However, where maximum speed is required, some time may be saved by the use of small sample volumes.

Experience has shown that about 2 min. are required to complete each evacuation cycle. Thus, using 100 cc. samples, about 10 and 30 min. are required to de-gas aqueous and oil samples, respectively. An additional 10 min. is required for analysis of the desorbed gases. Therefore, single determinations may take 20 to 40 min., depending upon the samples.

The new two-chamber evacuation system (inset in Fig. 1) has an im-

JOB WANTED

REGULATING TEMPERATURE

OF { VATS • TANKS • KETTLES • DRYERS
WATER and OIL HEATERS
JACKET WATER COOLING
DRYING and STORAGE ROOMS
and MANY OTHER USES

REDUCES COSTS—Maintains a constant temperature. Prevents losses caused by OVER-heating. Saves steam and labor. Helps to produce a better, more uniform product. Often pays back its cost several times a year and gives 10 to 25 years of service.

SELF OPERATING

EASY TO INSTALL

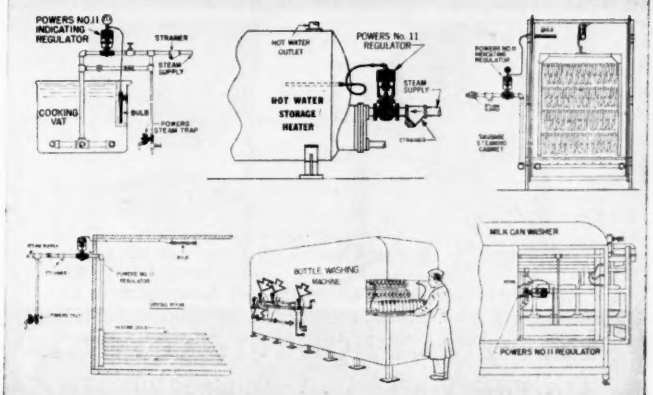
THE POWERS REGULATOR CO.
2720 Greenview Avenue
Chicago 14, Illinois
Offices in 50 Cities • Established 1891

SIMPLE • DEPENDABLE • ECONOMICAL

▶ Write for Bulletin 329

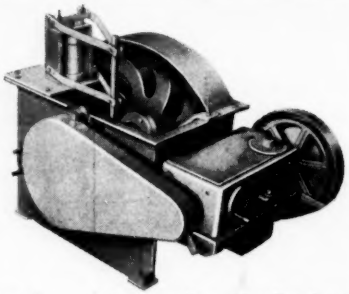
11G2

POWERS No. 11 Self-Operating REGULATOR



For Blending or Proportioning Food Mixes

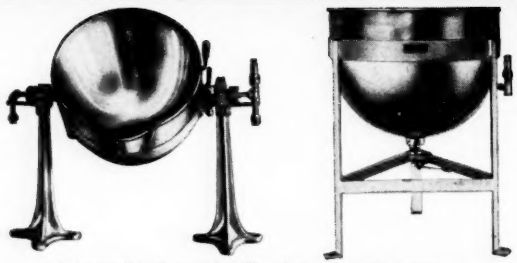
OMEGA
ROTODIP
Liquid Feeder



This dependable unit meters and feeds by volume all low viscosity liquids, solutions, and suspensions by means of a unique eight-dipper feeding wheel. Feeding is continuous, variable over a 100 to 1 range, and accurate to 99% or better. There are no troublesome valves, diaphragms, pumps, or restrictive openings. Handles liquid additives such as oils, extracts, coloring, salt solutions, syrups, etc., from 1 to 800 G.P.H. Available in sanitary constructions and materials specially suited to the food industry — also multiple-dipper wheel units with capacities up to 4000 G.P.H. on special order. Write for Bulletin.

OMEGA MACHINE COMPANY
(Division of Builders Iron Foundry) 84 Codding Street, Providence 1, R. I.

FOR EVERY PROCESSING NEED
LEE Kettles
WHERE
CORROSION-RESISTANT
EQUIPMENT IS NEEDED



Descriptive Bulletins on Request

LEE METAL PRODUCTS CO. INC.
416 PINE STREET . . . PHILIPSBURG, PA.
ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

proved vapor-liquid contacting action. The principal advantage of this system is that it is not necessary to boil the liquid in order to agitate it.

To operate this new gas desorber, the sample is first drawn into lower chamber (A). Thus, upper chamber (B) is evacuated. Stopcock (C) is then closed, and liquid is forced into evacuated chamber (B) through capillary orifice (D).

Passage of liquid through the orifice tip creates a fine spray which collects on the walls of the vessel and drains to the bottom in the form of a thin continuous film. The sample may be recycled in this manner until degassing is complete.

Apple Juice Analyzed

Freshly opened samples of commercially packed apple juice were subjected to various preliminary treatments with nitrogen and analyzed. The treated juices were then mixed with varying proportions of water saturated with air at known temperatures and pressures, and the composite samples were analyzed.

Table III shows complete recovery of nitrogen, while oxygen recovery is uniformly low. Since complete recovery of oxygen may be obtained from pure water, it is apparent that oxygen is rapidly consumed by chemical combination with constituents in the juice.

To confirm this, tests were made on freshly opened juice samples that had been aerated for varying lengths of time and at varying temperatures. Aeration was continued until limiting results were obtained, indicating the solubility of gases in juice saturated with respect to air.

Table IV shows how nitrogen values increase with time toward a value somewhat less than the solubility in pure water. Apparent limiting values for oxygen, however, are much lower than would be predicted on the basis of solubility in water. It seems that this discrepancy is due to the absorption of oxygen by chemical combination with juice. The relatively greater discrepancy at higher temperatures indicates an increased reaction rate with higher temperatures.

An attachment was designed for the modified gasometric apparatus, which was suitable for piercing closed containers and removing headspace gas for analysis.

This sampling device can be attached by capillary tubing to the capillary (or sample) tube (C) of the apparatus (Fig. 1), and the headspace gases can then be drawn into the desorbing bulb and analyzed in the usual manner. Fig. 3 shows the puncturing device for headspace analysis.

Effectiveness of the headspace gas

analysis procedure has been proven by numerous examinations of containers packed under controlled nitrogen atmospheres, where the oxygen was found to be nil. Inherent errors in this method are due to leakage of air into the system during piercing and sampling operations. This would tend to cause high results.

Construction of Device

The headspace sampling device is relatively simple to make, easy to use, and free of leaks such as those likely to occur at a packing gland.

This unit (Fig. 3) consists of a short, 1-in. dia. bar in which two intersecting holes are drilled. Soldered into one of the holes is a puncturing point, made by drilling out the center of a short, small diameter drill rod, with the tip bevelled at 60 deg. and then hardened. This point is not only durable, but with manual pressure it will readily puncture any ordinary tin can or bottle top.

Soldered into the other hole is a short length of larger tubing, through which headspace gas is withdrawn from the container to the gas analyzing apparatus.

Next, a piece of ⅛-to-¼-in. soft sheet rubber (1 in. dia.) is sealed to the surface of the container. Care must be taken to make an air-tight seal between the rubber and the top of the can or glass jar. This is done by dipping the rubber in melted beeswax and then pressing it against the can or jar cap until the wax film hardens. As a further precaution, melted wax may also be applied around the edges of the rubber with a small brush.

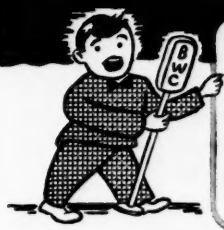
Space for puncturing is prepared near the center of the rubber by scraping off any wax likely to plug the sampling tip. The puncturing device is attached to the capillary (inlet) tube (C) of the gas analysis apparatus (Fig. 1) by means of a flexible, vacuum-tight connection. Then the needle tip is pressed into the rubber sealing disk, without piercing the container. The unit is supported in this position by means of suitable clamps. As an added precaution against leaks, a drop of oil is placed in the depression formed in the rubber by the point.

The sampling head and tube leading to the analyzer are now evacuated by manipulating the mercury in the desorbing bulb (Fig. 1) and stopcock (E). Thus, the contained air is pumped through the gas buret.

The hollow needle is then pressed through the can or bottle top, and the operation is completed by drawing a gas sample into the analyzing equipment. The gas is finally analyzed in accordance with the method described for dissolved gases in liquids.

The sampling device illustrated in

SURE, WE'VE MET... I'M CRIMPY
THE BUFFALO WIRE CLOTH MAN



I don't mean to brag, but **WHEN I'M SQUARE MESH STAINLESS STEEL . . .** you can't top me for sizing, separating, bolting and filtering jobs . . . especially in such industries as abrasive, sand, refractory, minerals, salt, chemical, flour, food, textile, paint and pharmaceutical.

I'M TOUGH – CAN ABSORB IMPACT!

It's hard to wear me out . . . and then I "wear clean". In fact, I last 4 times longer than many other fabrics. Break? I doubt if you can do it. After all, I've twice the tensile strength of ordinary steel.

100 PROOF...THAT'S ME!

I'm rustproof, tarnish proof, corrosion resistant, wear resistant, non-contaminating, non-discoloring. Need any more proof? Even high temperatures don't weaken me.

MOISTURE OR HUMIDITY DON'T BOTHER ME!

I'm efficient in all kinds of weather...don't take on moisture or swell like non-metallic cloths. That's why I'm used so much for bolting.

I'M FAST AS LIGHTNING!

With my smooth, polished surface, things whiz through me . . . very important in the smaller meshes, you know, to avoid blinding.

Buffalo SQUARE MESH STAINLESS STEEL WIRE CLOTH

is available in bolting and market grades, as well as special types for Salt Filter Slurry Screens and Backing Wire. It is furnished in rolls, cut pieces, reel covers or panels bound with webbing.

HELPFUL LITERATURE FREE ON REQUEST
Bulletin 590 Bolting Cloth
Bulletin 596 Market Grade
Bulletin 802 Salt Filter Slurry Screens and Backing Wire

Buffalo WIRE WORKS CO., INC.
Manufacturer of All Kinds of Wire Cloth Since 1869

452 TERRACE BUFFALO 2, N. Y.

For Fast Batch Grinding

PULVERIZER WITH MOTOR — RECEIVER BOX

Schutz O'Neill PULVERIZER

The Schutz-O'Neill Pulverizer with Receiver Box is a versatile unit, for rapid processing of any dry, grindable, non-gritty stock to desired fineness. Easy to clean or change for different materials. Accurate grinding control, with sharp separation and uniform fineness. Air force pulverizing plus air separation is the proven, automatic, dustless method.

Sizes from 12" up to 28", with capacities up to 2,000 lbs. per hour. Ask our engineers to analyze your requirements. No obligation.

Also makers of Schutz-O'Neill Gyrator Sifters, Roller Mills, Hammer Mills, Etc.

ESTABLISHED 1893 — SCHUTZ-O'NEILL CO. DIVISION OF PARTEN MACHINERY CO.

PULVERIZERS · BREAKER MILLS · ROLLER MILLS · BURR MILLS · HAMMER MILLS

309 SIXTH AVENUE SOUTH • MINNEAPOLIS 15, MINNESOTA

ROCHESTER DAIRY Saves

24 man-hours every day with a

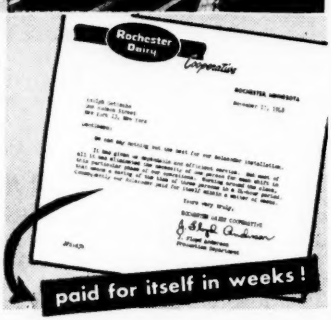
ROLACODER* CASE-MARKING ATTACHMENT

Add Rochester Dairy Cooperative to the list of plants that have replaced costly hand-stamp marking with a labor-saving ROLACODER. A small, precision-engineered attachment, the ROLACODER is easily installed on a case-sealer or conveyor to imprint cases automatically as they travel the line. Makes sharp, permanent marks of code-dates, lot numbers, varieties, trademarks, etc. from quickly interchangeable type or special dies. Friction-operated, self-inking. Models for located or continuous marking.

Request descriptive Data Sheet 6.0

* *Pat. Pending*

Representatives throughout U. S. and Canada



MARK-O-MATIC — ADOLPH GOTTSCHO, INC.

MACHINES TO MARK WHATEVER YOU MAKE

191 Duane St. — New York 13, N. Y.

Fig. 2 has been designed to remove headspace and occluded gases from products packed in tin cans. Exclusion of atmospheric oxygen from gas samples is assured by gas-tight construction of the sampler and a gasket sealing it to the tops of the cans.

The body of the sampler is pivoted in a clamping yoke so pressure may be applied to the gasket surface. The gasket is made of ¼-in.-thick neoprene. It has a ¼-in. wide face, and it is cemented into a ⅛-in. deep groove in the base of the sampler head.

A spindle is joined to the body of the sampler through a flexible "Hydron" brass bellows with soldered connections. Mounted on the lower end of the spindle is a sharp point for piercing cans, and a threaded stud is machined integral with the top of the spindle. A cap fits over the stud and the bellows. Adjustment of the wing nut on the stud prevents movement of the spindle until time to pierce the can. A rack and pawl provide positive clamping to the yoke which supports the sampler head.

Cans are automatically centered under the sampler head on a platform that is machined to accommodate cans up to and including No. 3 size. Gas samples are withdrawn through a ¼-in.-dia. tube attached to the body of the sampler.

A standard gas analysis buret, equipped with absorption bulbs (for oxygen and CO_2) and a Toepler vacuum pump, is required to analyze for headspace and occluded gases.

After the free space has been evacuated and the system is found to be gas tight, the can is punctured by backing off the wing nut and pressing down on the spindle. Next, the point is withdrawn from the hole in the can, and the headspace gas is pumped to reservoir connected to pump.

A vacuum is maintained in the can until diffusion of occluded gases ceases. The diffused gas is then pumped to the reservoir and combined with the headspace gas. The sample may be analyzed for oxygen and CO_2.

—End—

Convention Report

—Continued from page 122

with the fork, and a barrel lifter and dumper.

Clark Equipment Co. also exhibited the "Dynatork Drive"—a new eletromagnetic transmission. It transmits power from the engine by magnetic induction. To coils (one for "forward," the other for "reverse") are mounted within the flywheel and are surrounded by magnetic poles. The poles rotate with the flywheel and are the driving

members. Two rotors attached to a special forward-and-reverse constant-mesh gearing are the driven members. The magnetic inductive force is applied through an air gap, and there is no metal-to-metal contract between driving and driven members. The drive is reported to permit instant reverse of the truck, to cut wheel slippage, and to reduce repair cost and "down time."

A selector switch on the steering column provides finger-tip control of truck movement. For "inching," the necessary variation of voltage to flywheel coils is controlled by a foot-pedal.

Known as the "Unitable," a food plant conveyor constructed of stainless steel and employing a sanitary belt was exhibited by Conveyor Specialty Co., Inc. The table is made in 10 ft. sections, two or more of which can be assembled to give various lengths.

Freight can be raised to the level of trucks or freight cars, or to different building levels by the "Levelator Lift," displayed by Rotary Lift Co. It is an oil-hydraulic or compressed-air elevator designed to eliminate the need for loading docks or ramps.

To solve the problem of leveling motor truck floors with loading docks, Rowe Methods, Inc., has developed the "Adjust-A-Truck." It comprises a steel deck with one end pivoted on a trunion and the other raised and lowered by a hydraulic lift.

Loading ramps or dockboards built of very light magnesium alloys were displayed by the Magnesium Co. of America. Also shown were lightweight hand trucks made of the same metal.

Comet Mfg. Co. exhibited a motorized hand truck powered by a 4-cycle 1½-hp. gas engine. Travel speed under 2,000 lb. load is from 2 to 5 mph. The truck can haul 1,500 lb up short, 20 percent grades.

For lifting and dumping free-flowing materials, including liquids in loads up to 500 lb., a portable dumper was displayed by Colson Equipment & Supply Co. The unit comprises a light structural A-frame and a small motor-driven hoist which lifts and dumps the skip.

Bags of sugar, or other similar materials, can be lifted and dumped evenly with the "Upanover" introduced by Jacob House & Sons.

Among the new overhead handling equipment displayed was the Whiting "Trambeam" Crane and Monorail system. One of its features is flexible suspension of the track or runway beams from the building structure. This is accomplished by ball-and-socket connections designed to avoid distortion of the supporting rods and distribute the load evenly.

Awarded by The Franklin Institute for Discovery, Invention, or Development in Physical Science

RESEARCH REPORT

NUMBER TWO

ON THE PROGRESS OF MAKING DRY SEPARATIONS BY SPECIFIC GRAVITY THROUGH AIR-FLOTATION

COMPILED FROM SIXTY-ONE YEARS OF SPECIALIZED EXPERIENCE IN SEPARATIONS

OATS FROM GROATS: *Reproduced above are unretouched photographs of product samples taken during pre-delivery tests of a Sutton, Steele, and Steele Specific Gravity Separator. In this particular case the customer's problem was the separation of oats from groats (the edible parts of oat kernels).*

PRODUCT ENGINEERING

The example "oats from groats" is only one of hundreds of other types and classes of products, both agricultural and industrial, which are being separated from contaminations and upgraded to usable quality by specific gravity through air-flotation.

In a capsule, the famous S S & S Process consists of "floating" a product, in bulk form, on a cushion of air over an oscillating deck. Here the actions of specific gravity, plus vibration of the deck, separate and classify each particle of material according to individual density.

Every minute of every processing day you'll find S S & S Specific Gravity Separators being used where the problem is one of *cleaning, separating,* and *grading,* and S S & S Air-Float Stoners for two-way separations of heavier contaminations from the lighter end product.

WHEN SEEING IS NOT NECESSARILY "BELIEVING"

Here's how one of our customers used a Specific Gravity Separator to outwit, of all things, *a worm!*

When insects attack Garbanzos (or chick peas) the worm eats part of the pea, makes a hole, and "pulls the hole in after him" by depositing a film across the doorway. This makes his damage virtually impossible to detect with the naked eye.

However, an S S & S Specific Gravity Separator is being used very effectively to separate lighter worm eaten Garbanzos from the heavier useable product by specific gravity through air-flotation.

FACTS ABOUT THE WETHERILL MEDAL

The John Price Wetherill Medal (see upper left) was first awarded in 1926. Mr. Frank Twyman received it for his work on the *Interferometer,* and the Wagner Electric Corp., for the *Alternating Current Motor.* Sutton, Steele, and Steele received the award in 1931 for development of a *Method and Apparatus for Dry Cleaning Coal.*

LITERATURE AVAILABLE

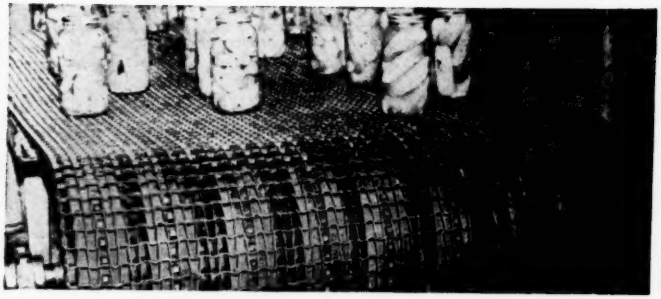
Tell us about your separating problem and we will forward bulletins which describe in detail how the famous S S & S Process can be applied successfully to your particular needs. Address inquiries to:

DEPARTMENT A

SUTTON, STEELE & STEELE, INC.
1031 SOUTH HASKELL AVENUE
DALLAS, TEXAS, U. S. A.

SUTTON, STEELE & STEELE, INC.

Dallas, Chicago, Des Moines, Minneapolis, New York City, Pittsburgh, San Francisco, Columbus, Ga., Jackson, Mich.
Foreign: Winnipeg, Canada; San Paulo, Brazil; London, England.



It's a DEPENDABLE Belt when it's made by

CYCLONE!

Cyclone Metal Conveyor Belts and dependability go hand-in-hand . . . Cyclone engineers see to that. Using one of three basic styles — Flat Wire (illustrated), Chain Link or Flex-Grid, they design Conveyor Belts that are absolutely *right* for the jobs in question. Get in touch with the nearest Cyclone sales office, and reap the dividends of Cyclone's 25 years' experience in making Conveyor Belts. Offices are in principal cities; plants are in the Midwest and on the Pacific Coast. Catalog No. 4 is yours for the asking.

By the makers of Cyclone Fence
CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
DEPT. H-118, WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

UNITED STATES STEEL

★ Guardians OF THE NATIONS FOODS

DETROIT
1448 WABASH AVE.
ZONE 16

CHICAGO
2101 W. PERSHING RD
ZONE 9

UNITED STATES COLD STORAGE

Four Modern Fortresses For Guarding The Nation's Foods

DALLAS
1114 WOOD STREET
ZONE 2

WRITE FOR DETAILS

KANSAS CITY
500 EAST THIRD ST
ZONE 6

Selecting Detergents

—*Continued from page 73*

2. The compatibility of ingredients under the conditions of use.

3. The possibility of precipitating water hardness with these materials.

4. The effect on their efficiency of the concentration and temperature at which they are likely to be employed.

Because so many factors are involved, specific details for mixing or preparing detergents are not included in this article. Instead, only general information is given for formulating highly alkaline, moderately alkaline, and neutral detergents. These three groups include most of the cleaning agents generally used in food plants.

Highly alkaline detergents contain caustic soda as the primary active ingredient. They also may contain sodium metasilicate as a corrosion inhibitor and wetting agent, and either trisodium or pyrophosphate as a water conditioner. And, it is not uncommon for such detergents to contain soda ash (sodium carbonate), which serves as a buffer to maintain the desired pH when dissolving acid deposits.

Wetting agents also may be added to increase the wetting and rinsing properties above those produced by sodium metasilicate, although certain of the wetting agents precipitate out when the pH is too high. Such detergents are especially good for removing fats, oils, and dried-on or burned-on material, but are corrosive to iron, tin, aluminum, oil paints, wood and fabrics, unless sufficiently inhibited. They are not harmful to rubber or concrete surfaces.

Moderately alkaline detergents are variable in composition, with soda ash, sodium metasilicate, or trisodium phosphate serving as the basic ingredient, either alone or in combinations of two or all three. The moderately alkaline detergents generally contain one of the phosphates for water conditioning, the one used being determined by the hardness in the water. These detergents also frequently contain a wetting agent of the sulphonic acid type.

The moderately alkaline detergents are less corrosive than strong alkalis, but if they do not contain metasilicate they may be corrosive under certain conditions of use. Most of the general-purpose cleaners are in this group.

Neutral detergents are relatively new for use in food plants. They are mixtures of strong wetting agents and a phosphate or some other fairly neutral builder to give the solution detergent properties in addition to the surface-active effects of the wetting agent. These detergents normally are not corrosive and therefore can be used generally throughout plants.

While general indications have been given for formulation, it should not be attempted without the advice of someone well qualified in the field. There are on the market numerous proprietary compounds which fall into each of the three detergent groups mentioned, and from which many excellent cleaners can be selected. But in every case, the selection should be based on a consideration of the properties and qualifications, as mentioned in this paper.

For greatest economy in cleaning and to avoid misuse, it is advisable to limit the cleaners in any one food plant to not more than one from each group. There may be exceptions, but for most plants two or three detergents will suffice. As a safety measure these materials should be carefully labeled in respect to their corrosiveness and general use.

No detergent should be used in a food plant until information has been supplied by the manufacturer as to its general properties and classification as a strong, moderate, or neutral detergent.

References

1. P. N. Burkard. "Some Detergent Properties of Interest to Canners." *The Canner*, Feb. 16, 1946, pages 20-22.
2. C. L. Baker, "Detergent Values of Sodium Metasilicate," *Ind. Eng. Chem.* Vol. 23, No. 9, 1025-1032 (1931).
3. C. L. Baker, "Effect of Alkaline Detergents Upon Metals," *Ind. Eng. Chem.*, Vol. 27, No. 11, 1358-64 (1935).
4. Cherry-Burrell *Dairy Alkali Handbook*, 3rd Ed. (1947).
5. P. H. Fall, *J. Phys. Chem.* Vol. 31, 801-849 (1927).
6. George O. Hall, "Sanitary Value of Sodium Metaphosphate (Calgon) in Dishwashing," *Ind. Eng. Chem.* Vol. 29, No. 4, 421-424 (1937).
7. Ray C. Hughes, "Machine Dishwashing Compounds," *Ind. Eng. Chem.* Vol. 37, No. 2, 170-175 (1945).
8. Ernest C. McCulloch, *Disinfection and Sterilization*, Lea & Febinger, Philadelphia, 1945.
9. Milton E. Parker, *Food Plant Sanitation*, McGraw-Hill Book Co., Inc., 1948.
10. Anthony M. Schwartz, "New Concepts and Trends in the Detergent Field," *Soap and Sanitary Chemicals*, April 1948, 51-54 and 181-184.
11. Charles Schwartz and C. J. Munter, "Phosphates in Water Conditioning," *Ind. Eng. Chem.*, Vol. 34, No. 1, 32-40 (1942).
12. Charles Schwartz and Bernard H. Gilman, "Sodium Metaphosphate in Mechanical Dishwashing," *Ind. Eng. Chem.*, Vol. 26, No. 9,998-1001 (1934).
13. Foster Dee Snell, "Detergency of Alkaline Salt Solutions," *Ind. Eng. Chem.*, Vol. 24, No. 1, 76-78 (1932).
14. Foster Dee Snell, "Detergency of Alkaline Salt Solutions—III, Deflocculating and Emulsifying Power," *Ind. Eng. Chem.* Vol. 25, No. 2, 62-165 (1933).
15. Foster Dee Snell, "Detergency of Alkaline Salt Solutions—IV, Laboratory Comparisons in Simulation of Laundry Practice," *Ind. Eng. Chem.*, Vol. 25, No. 11, 1240-1246 (1933).
16. Ira I. Somers, "How to Establish a Plant Cleaning Program," *Food Industries*, Vol. 20, 8-12, 166, 199-204, 328 and 330 (1948).
17. James G. Vail, "Soluble Silicate Cleansers," *Ind. Eng. Chem.* Vol. 28, No. 3, 294-299 (1936)
18. C. B. F. Young and K. W. Coons, *Surface Active Agents*, Chemical Publishing Co., Inc., New York (1945).
19. H. W. Zussman, "Sequestering Agents," *Soap and Sanitary Chemicals*, February 1948.

flavors

for EVERY Purpose

... and the BEST flavor for your PARTICULAR purpose!

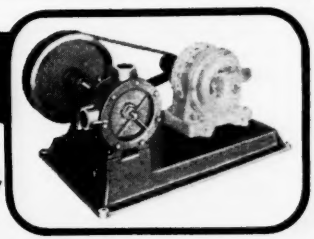
Our FREE catalog will interest you. It describes a Special Service available to flavor users. Write us for Flavor Catalog No. F-481.

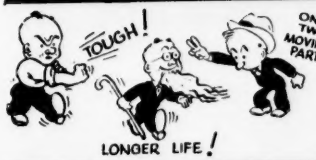
FRITZSCHE Established 1871 Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES and *STOCKS: Atlanta, Georgia, *Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, Cleveland, Ohio, Dallas, Texas, Detroit, Michigan, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, *St. Louis, Missouri, *Toronto, Canada and *Mexico, D. F. FACTORY Clifton, N. J.

You get these ... and more with



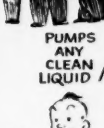


COMPLETE RANGE OF CAPACITIES!

VIKING PUMPS

That's right . . . with a Viking, you get a tough, rugged pump, one with long life, one with only two moving parts, one that will pump any clean liquid regardless of viscosity and the most complete range of capacities, sizes and styles from which to choose.

PUMPS ANY CLEAN LIQUID

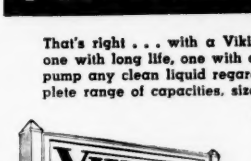


But added to this, you get . . .

Self priming (no added gadgets)
Smooth, even discharge
Low speed — long life
And a dependable pump that is built to do the job intended.

With a Viking, you get the right pump for the job.

Ask for free folder 100E today.



See Our Catalog in SWEETS

Viking PUMP COMPANY Cedar Falls, Iowa

A New Improved UNIVERSAL COLLOID AGENT

IT SUSPENDS . . .
IT GELS . . .
IT EMULSIFIES . . .
IT STABILIZES . . .
IT THICKENS . . .

We are now producing from Carragheen two new improved types of gelose. One of them should be the answer to your emulsifying, suspending, thickening or stabilizing problems.

KRIM-KO GEL is an all-purpose colloid-assistant. Properly used, it has been proved effective in many of the most exacting food, pharmaceutical and industrial applications.

CARRAGAR is an agar-type gelatin which forms tender, fruit-like gels over a wide pH range. It does not require acidulation to produce desired results.

Send for free liberal working samples for experimental use.

get all the facts

Unless you have these two great catalogs on hand, you are missing two of the most complete sources of spray nozzle data ever produced. Whatever your requirements, you will be taking a big step toward lower spraying costs and better performance by writing for Spraying Systems Spray Nozzle Catalogs No. 22 and 23. Why not write right now?

SPRAYING SYSTEMS CO.
Engineers and Manufacturers
3212 RANDOLPH STREET • BELLWOOD, ILLINOIS (Suburb of Chicago)

Sterilizing Canned Corn

—*Continued from page* 86

that occurs at the can walls with conventional cream style corn.

Cremogevac corn may be packed in cans of any size. In the No. 10 can, as in the No. 1 can, it requires a process only slightly more severe than that of whole kernel corn. Consequently, the organoleptic quality of the product in cans of all sizes is correspondingly better than that of premixed cream style corn. Cremogevac corn also has better nutritive quality, because the process is less destructive of vitamins.

From a nutritive standpoint, compared to brine-packed whole kernel corn, Cremogevac corn possesses a psychological advantage, too. In using the former product, the consumer often discards a portion of the brine, which contains soluble nutritive factors. But the brine in Cremogevac corn becomes intimately associated with the cream component and is never discarded. Moreover, a larger amount of corn can be packed into a given container by the Cremogevac method than by either the vacuum or the brine method of packing whole kernel corn.

Compared to premixed cream style corn, Cremogevac corn costs less to pack, because of the increased plant capacity and savings in labor and steam which result from the use of shorter sterilizing processes. Equipment-wise, the product has the advantage of not requiring the use of a corn mixer.

Three facts make the use of a continuous cooker practicable for Cremogevac corn, whereas it is not practicable for conventional cream style corn. First, the required process is short enough to be within the range of a cooker of moderate size. Secondly, a small amount of agitation may be applied to cans during sterilization without sacrificing the advantage of a short process, and possibly even with some further shortening of the process. Finally, coagulation of corn cream is not produced as readily by agitation when cream is concentrated as it is when cream is diluted.

As its name implies, the Cremogevac process is regarded as being operated normally under a system of vacuum closure for the containers. This is the case when the product is at or near room temperature when the container is sealed. While such technic is normal for the process, the successful operation of the process does not depend upon use of a vacuum closing technic.

Sufficient Cremogevac corn has been packed to assure the practicability of the method.

Sampling Device

—*Continued from page* 105

tioned on top of the cylinder and directly over the discharge hole. This device, working on a hinge and under the tension of a small spring, exerts a slight pressure on the contents of the slot. However, it is not required for all products being sampled. The more granular and free-flowing the material, the less need for this precaution against clogging or packing.

The backward and forward movement of the plunger is obtained through the action of a 2-in. cam on the slow-speed shaft of a standard reduction gear using ½-in. shafts. Various reduction ratios may be used, but generally 600:1 gives the best results. Power for the unit is provided by a standard ⅛-hp. electric motor through a V-belt drive with a pulley combination which gives the desired speed.

Directional control over the movement of the plunger is obtained by a small crank (on the cam) working in a perpendicular slot or yoke. The torque pressure exerted by the crank action is offset by a leveling roller operating in the horizontal slot of the guide yoke.

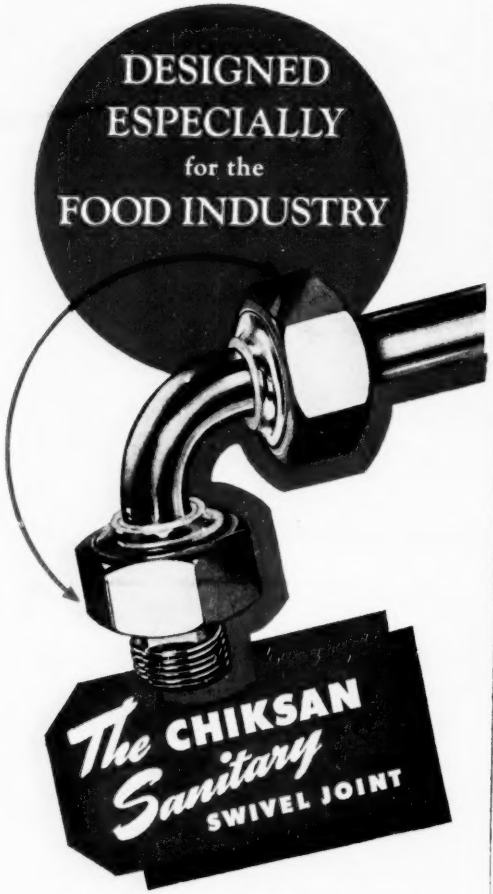
Unless these precautionary details are embodied in the drive mechanism, the movement of the plunger will not be smooth and uniform, and there will be development of lost motion through the wearing of working surfaces. Inclusion of the leveling roller eliminates the torque pressure to such an extent that the unit with this roller operates almost continuously without requiring any special attention. All that seems necessary is periodic cleaning and replacement of the V-belt.

Although the sampling box may have almost any desired capacity, each compartment in the one illustrated holds about 5 qt. The speed of operation is usually set to obtain a composite sample of 3 qt. for each carload of commodity run. As each carload is completed, the sample box is slid along its supporting header board to put the next empty section into receiving position. Accordingly, there can be a continuous sampling run of as many carloads as the sampling box has sections—that is, between the times that the samples can be conveniently collected for laboratory investigation.

It may be noted that no attempt has yet been made to commercialize this automatic sampler, in spite of the decided advantages it demonstrated over manual sampling during the war, when inspection personnel was so scarce and the need so great for frequent sampling.

YOUR
PRODUCTS
arrive
r-fresh and pure
protected by linings developed in the
INLAND STEEL
CONTAINER
laboratories to meet your problems
The best insurance you can give your product is the "purity protection" of Inland Steel Containers.
Your customers appreciate that extra mark of care which brings them your food or meat products with flavor, color, and purity fresh and unchanged.
It's the scientifically developed inner lining that gives you this protection. Probably Inland laboratories have the perfect lining for your product already. If not, let our laboratories develop one for you.
Every feature of the Inland Container line is designed to add sales appeal to your product—from the extra-strength features illustrated, to the full-color trademark printing service. Write for details.
Inland Steel Container Co.
Container Division

DESIGNED ESPECIALLY for the FOOD INDUSTRY



Here is a Swivel Joint which embodies 20 years of experience in designing and manufacturing Swivel Joints for all purposes . . . thoroughly tested for all sanitary applications . . . and meeting all sanitary requirements.

The CHIKSAN *Sanitary* Swivel Joint, made of stainless steel, provides full 360° rotation with easy turning. It makes possible the installation of stainless steel pipe lines with all the flexibility of an ordinary hose.

DISTRIBUTED NATIONALLY BY
CERRY-BURRELL CORPORATION
General Offices 427 W. Randolph St., Chicago
THE CREAMERY PACKAGE MFG. COMPANY
General Offices: 1243 West Washington Blvd., Chicago
OUR 20TH ANNIVERSARY

CHIKSAN TRADE MARK
CHIKSAN COMPANY
AND SUBSIDIARY COMPANIES
BREA, CALIFORNIA New York 7
WELL EQUIPMENT MFG. CORP. HOUSTON 3, TEXAS
MID-CONTINENT AREA
CHIKSAN EXPORT CO. BREA, CALIFORNIA - NEW YORK 7
EXCLUSIVE EXPORT REPRESENTATIVE

BALL-BEARING SWIVEL JOINTS FOR ALL PURPOSES

MAILING LISTS THAT WORK OVERTIME

McGRAW-HILL Industrial Mailing Lists are a direct route to today's purchase-controlling executives and technicians in practically every major industry.

These names are of particular value now when most manufacturers are experiencing constantly increasing difficulty in maintaining their own lists.

Probably no other organization is as well equipped as McGraw-Hill to solve the complicated problem of list maintenance during this period of unparalleled changes in industrial personnel. These lists are compiled from exclusive sources, based on hundreds of thousands of mail questionnaires and the reports of a nation-wide field staff, and are maintained on a twenty-four hour basis.

Investigate their tremendous possibilities in relation to your own product or service. Your specifications are our guide in recommending the particular McGraw-Hill lists that best cover your market. When planning your industrial advertising and sales promotional activities, ask for more facts, or, better still, write today. No obligation, of course.

McGraw-Hill Publishing Co., Inc.
Direct Mail Division
330 West 42nd Street New York, 18, N. Y.

A CAREER GIRL Starts to Work

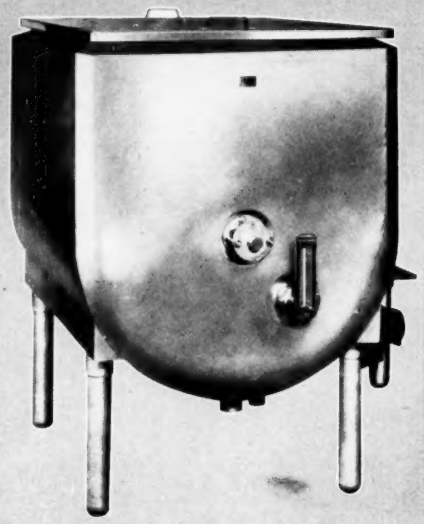
MEET a lively lady . . . **RIPCO MAID**. She's our new paper machine and shown here is about one-twentieth of her. A velvet-smooth performer . . . smart of line . . correct in every detail . . she indeed has *class*.

There is a quality in the purring performance of this great machine that prevails throughout this well-integrated mill . . in its vastly expanded plants . . . in its batteries of new equipment. You will find it, too, in our broad line of better-than-good glassine and greaseproof papers and converted specialties that are ever finding new packaging uses. Perhaps we have a paper that will serve you better than what you use now. Haven't you a problem we can tackle with you?

RHINELANDER PAPER COMPANY

Rhinelander, Wisconsin

Another step forward in food processing



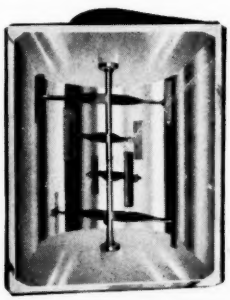
THE NEW "CHR" JACKETED SAN-I-TANK HAS THESE ADVANTAGES

1. GREATER CAPACITY IN LESS SPACE
2. STAINLESS STEEL WELDED CONSTRUCTION
3. GUARANTEED AGAINST RUST AND CORROSION
4. BUILT LOW FOR FAST, CONVENIENT OPERATION
5. SMOOTH, HIGHLY POLISHED INTERIOR
6. NO PROTRUDING COILS
7. EFFICIENT MULTIPLE MIXING PADDLES
8. SPECIAL HIGH-PRESSURE JACKET

The CHR San-I-Tank is an entirely new design in jacketed tanks for processing heavy foods such as starch, mayonnaise, jams, jellies, candies and many others. The unit is readily adapted for either cooking or cooling. Operation is simple, convenient and fast . . production is increased. The special construction of the jacket which is welded directly to the inner tank permits maximum "flooded-surface" contact. Tests have proven that a full tank of light liquid can be brought up to boiling within the short time of thirty minutes. Two inches of permanent glass-wool insulation prevent heat loss between the inner and outer shell of the tank and protect the operator.

At the right is a top view of the CHR Tank showing the smooth, highly polished stainless steel interior. There are no coils to clog or collect unsanitary waste. A series of eight heavy-duty mixing paddles are arranged to speed processing by constantly agitating the liquid against the heated tank jacket. Efficient scraper blades on the paddles prevent the mixture from sticking to the tank walls. Propeller type agitator is also available for mixing light liquids.

Investigate this new tank before you buy. Send today for complete information.



THE FINEST IN MODERN EQUIPMENT FOR FOOD PROCESSORS

Durable, stainless steel Percolators provide a fast, economical method of extracting flavors from vanilla, berries, herbs, etc. San-I-Tank Percolator installations have proved they speed up the process of extraction and maintain a thoroughness impossible to obtain by ordinary methods.

The Type H stainless steel San-I-Tank is recommended for applications where overhead space is limited. Primarily used for storage, it may be fitted with a Rotary Seal Agitator for mixing operations. Choice of outlets, inlets and gauge glass assemblies.

STAINLESS STEEL SAN-I-TANKS

SERVING THESE INDUSTRIES: *BEVERAGE · MILK · FOOD · DRUGS · CHEMICALS · COSMETICS*

METAL GLASS PRODUCTS COMPANY

GENERAL OFFICES BELDING 2, MICHIGAN

Do You Know?

CP Boosters and complete refrigeration equipment for foods, beverages, curling rinks and other purposes. 2, 4 and 6 cylinder CP Compressors.

CP Stainless Steel Multi-Process Tanks are ideal for pasteurizing and mixing milk, cream, buttermilk, mix and many other products Vapor or Film Heating.

CP Auto-Speed Babcock Centrifugal Testers have built-in speed characteristics that eliminate errors in test reading due to too high or too low speed.

CP Stainless Steel Fittings and Tubing available from warehouse stocks, coast to coast.

— CP Stands for The Creamery Package Mfg. Company, one of the world's largest manufacturers of dairy and food processing equipment and supplies — operating five factories and twenty-two branches.

•

OTHER GOOD THINGS FROM CP

Check nearest CP Branch or Write for FREE Bulletins

• CAN WASHERS • HOMOGENIZERS • CONTINUOUS and BATCH ICE CREAM FREEZERS • COMPRESSORS and other REFRIGERATING MACHINERY • ROTO-SEAL PUMPS • EMERY AGGREGATE FLOORS • RUBBER APRONS • BRUSHES • CLEANERS • THERMOMETERS

THE *Creamery Package* MFG. COMPANY

General and Export Offices

1243 W. Washington Blvd., Chicago 7, Illinois

BRANCHES: Atlanta • Boston • Buffalo • Chicago • Dallas • Denver • Houston • Kansas City, Mo. • Los Angeles • Minneapolis • Nashville • New York • Omaha • Philadelphia • Portland, Ore. • Salt Lake City • San Francisco • St. Louis • Seattle • Toledo • Waterloo, Ia.

CREAMERY PACKAGE MFG. CO. OF CANADA, LTD. — TORONTO

With Wax You're Sure

HOW MUCH IS *Package Protection* WORTH TO YOU

If you're like most producers, PROTECTING your product is worth the difference between profit and loss. Thousands of dollars worth of foods are spoiled each year because faulty packaging permits contamination to do its costly work.

To assure your reputation as a producer of quality goods you must see that your product arrives in the hands of the consumer at the same excellent standard with which it left your factory. Whether the problem is keeping moisture in or dampness out, will be well worth your time to test—

BARECO *Microcrystalline* WAX

- High Water Vapor Resistance
- Excellent Heat Sealing Characteristics
- High Melting Points
- Excellent Adhesive Characteristics
- Chemically Inert

WRITE TODAY

SAMPLES AVAILABLE ON REQUEST

BARECO OIL COMPANY

Dept. P — Box 2009 TULSA, OKLAHOMA

Dept. P — Widener Bldg. PHILADELPHIA, PA.

MOST DEPENDABLE AIRTIGHT OR VACUUM SEAL— the Anchorvac* D Cap

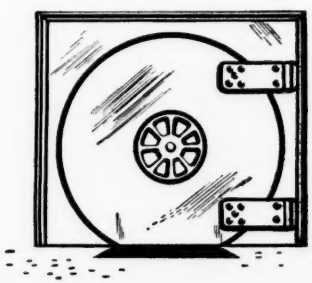
THE *Anchorvac* D Cap provides the most efficient, most dependable, tamperproof seal known for foods packed in tumblers, jars and bottles.

All types of food products—whether vacuum packed, sterilized, processed, packed hot or cold—are afforded fullest protection against air, moisture or bacterial action by the *Anchorvac* D Cap.

Its seal is mechanically formed well below top edge of container by compressing sealing gasket into a tight, even contact with container finish. It will not vent in processing and will withstand pressures higher than other types of vacuum closures.

Anchor sealing machines are available at nominal rentals to apply *Anchorvac* D Caps, with or without vacuum, at speeds ranging from 20 to 125 per minute.

*Trade-Mark



ANCHOR HOCKING
GLASS CORPORATION
Lancaster, Ohio

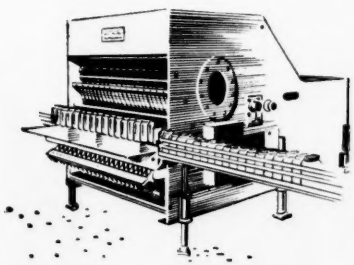
WASHING IS FAST, SURE AND EASY– with Anchorglass* Containers

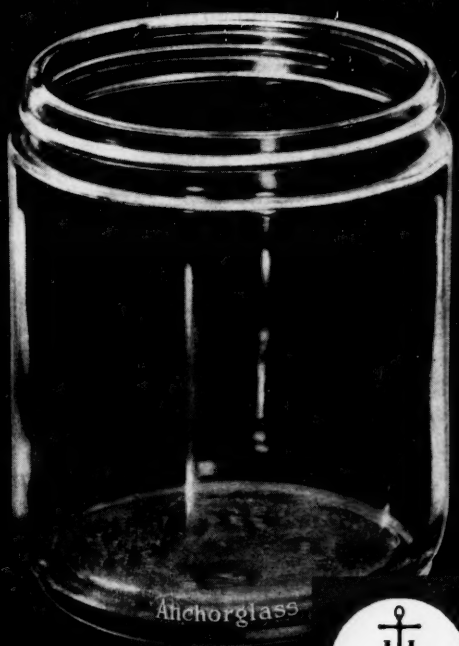
THE toughness, uniformity and strength of *Anchorglass* containers permit uninterrupted movement through washing, rinsing and preheating operations regardless of whether the containers are upright on a conveyor or inverted in the washer.

The superb performance of *Anchorglass* containers in the washing operation is the result of improvements in design; consistency in manufacture; accurate temperature controls in annealing; quality control through laboratory tests and regular inspections and in Anchor Hocking's constant emphasis on highest manufacturing standards.

Anchorglass containers are available in all standard styles and capacities, in crystal, amber and emerald green glass.

*Reg. U.S. Pat. Off.





ANCHOR HOCKING
GLASS CORPORATION
Lancaster, Ohio

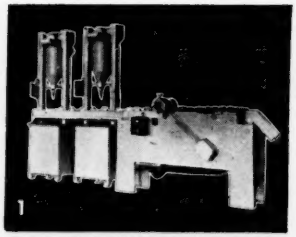
THE S&S LINE

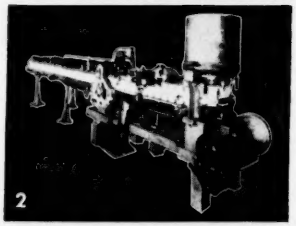
FOR BETTER PACKAGING

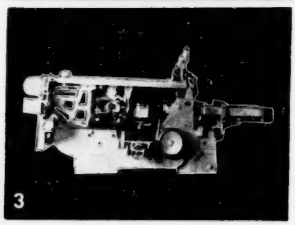
Whether your product goes to the consumer in bottles or cans, odd shapes, boxes or bags, there's an S & S packaging machine with speeds to suit your needs.

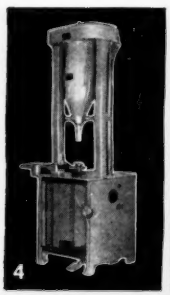
Our Engineering staff is always available to help in the solution of your packaging and filling problems.

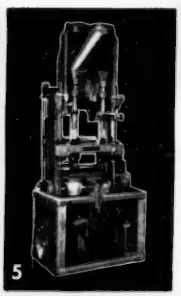
Write for further information


1

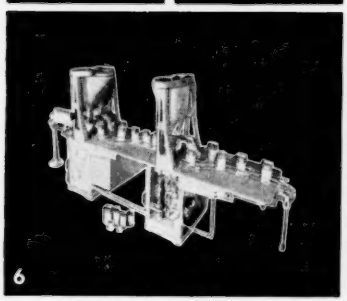

2

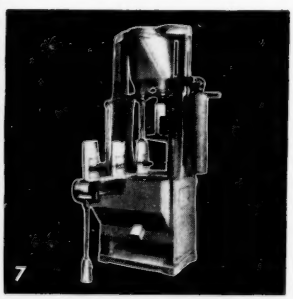

3


4


5

1. Bag & Envelope Sealer
2. Neverstop Carton Filler & Sealer
3. Automatic Tight Wrapper
4. Universal Filler
5. Stokeswrap Packaging Machine
6. Automatic Double Unit Filler
7. Duplex Packer & Weigher


6


7

STOKE S&S SMITH Co

PACKAGING MACHINERY — PAPER BOX MACHINERY

(A wholly owned)

Subsidiary of Food Machinery and Chemical Corporation

4911 Summerdale Ave., Philadelphia 24, U. S. A.

6 times THE POWER OF ORDINARY SOLENOID VALVES

GENERAL CONTROLS K-10 SERIES

Electro-Magnetic Lever Valves

SIX TIMES THE POWER of ordinary solenoids assures high seating pressure and overcomes the blocking effect of viscous fluids such as heavy fuel oil. Adequate power of solenoid insures positive operation.

Controls light and heavy oils, air, water, steam, refrigerants, etc. Pressures to 1000 lbs. and temperatures to 400 degrees F.

Normally closed or open types. Two-wire A.C. or D.C.—current failure—packless construction. Internal valve assembly can be removed for cleaning and inspection if necessary. *Request Catalog.*

GENERAL CONTROLS

631 ALLEN AVENUE GLENDALE 1 CALIF.

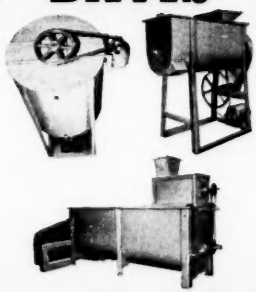
FACTORY BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

63-6

The Answer

TO LOW COST, SANITARY UNIFORM MIXING IS

DAVIS



WE HAVE BEEN SERVING FOOD MANUFACTURERS

Since 1894

H. C. DAVIS' SONS MILL MACHINERY CO.

BONNER SPRINGS, KANSAS

What Makes A Mailing Click?

● *Advertising men agree —the list is more than half the story.*

McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer thorough horizontal and vertical coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

New names are added to every McGraw-Hill list daily. List revisions are made on a twenty-four hour basis. And all names are guaranteed accurate within two per cent.

In view of present day difficulties in maintaining your own mailing lists, this efficient personalized service is particularly important in securing the comprehensive market coverage you need and want. Ask for more detailed information today. You'll probably be surprised at the low over-all cost and the tested effectiveness of these hand-picked selections.

McGraw-Hill Publishing Co., Inc.
DIRECT MAIL DIVISION
330 WEST 42nd ST.
NEW YORK 18, N. Y.

CM METEOR
● Heavy duty electric hoist for stationary, plain, geared or motor driven trolley suspension. Single and two speed models. Capacities: ½ to 5 tons.

Here's Plant Improvement that

Pays off in 3 Ways

HOIST POWER

LOWERS HANDLING COSTS — Picks up raw materials, or finished parts for assembly and moves them along for pennies in power and seconds in time.

ACCELERATES PRODUCTION — Takes the slowing up "lags" out of assembly line movement. One man precision "spotting". Speeds up handling in shipping.

IMPROVES PLANT MORALE — Saves the backs and muscles of men so that they may produce with "morning" efficiency in late afternoon. Aids in accident control.

Frankly, we don't know how many factories have cut costs by putting CM Electric Hoists on production jobs, but we *do know* they keep coming back for more and more Meteors and Comets. You couldn't ask for more convincing evidence of a product's usefulness to industry than a constantly growing demand.

CM Meteor and Comet advantages are fully described in the complete CM Catalog. Write us for a copy and the name of your local distributor.

CM COMET High speed, sturdy, portable electric hoist. One hand control. Plug in on single or 3 phase power line. Capacities: ⅛ to 1 ton.

CHISHOLM-MOORE
HOIST CORPORATION
(Affiliated with Columbus McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York, Chicago and Cleveland • Distributors Everywhere

PROFESSIONAL SERVICES

PROCESSING PROBLEMS — PRODUCT DEVELOPMENT — MARKET RESEARCH — PLANT LAYOUT and DESIGN — PACKAGE DESIGN and TESTING MANAGEMENT — PUBLIC RELATIONS — GENERAL CONSULTING — PATENTS — CHEMICAL, BACTERIOLOGICAL and NUTRITIONAL ANALYSIS

ASSOCIATED ENGINEERS, INC.
Consulting Engineers
Food Production Development

Analysis — Processing
Structural Design
Special Equipment Design
and Development

230 E. Berry St. — Ft. Wayne, Ind.

Bio-Science Laboratories, Inc.
Research - Control - Development

Vitamins, Hormones, Amino Acids—Nutritional, Pharmacological, Bacteriological Studies, Foods and Drugs

S. Berkman, Ph.D. — R. J. Henry, M.D.
O. J. Golub, Ph.D. — M. Segalove, Ph.D.

Write for descriptive brochure F
10717 Venice Blvd., Los Angeles 34, Calif.

J. Paul Bishop and Associates
Consulting Chemical Engineers and Food Technologists

Reports—Layouts—Canning and Freezing Processes—Food Bacteriology—Sanitary Control—Food Engineering — Atmospheric Pollution — Unit Operations—Process, Product and Equipment Design—Industrial Heating, Ventilating, Air Conditioning and Refrigeration.

Write for brochure—mentioning this publication.
105 North Second Street — Champaign, Illinois

FOOD RESEARCH LABORATORIES, INC.
Philip B. Hawk, Ph.D., President
Bernard L. Oser, Ph.D., Director

Research, Analyses, Consultation for the Food, Drug and Allied Industries.

Write for descriptive brochure.
48-14 33rd Street, Long Island City, N. Y.

INDUSTRIAL FOOD LABORATORIES
All Phases of Food Technology

Production Control - Product Development
Analytical - Research - Consultation
Bacteriology - Sanitation

Food — Dairy Products — Beverages

549 W. Washington St. — Chicago 6, Ill.

LANCASTER, ALLWINE & ROMMEL
Registered Patent Attorneys

Patent Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request.

Suite 457, 815-15th St., N. W.
Washington 5, D. C.

LEWIN ASSOCIATES
Industrial Consultants

DAVID N. LEWIN, Ph.D., FOOD CONSULTANT
JOSEPH D. LEWIN, CONSULTING ENGINEER
Designs—Layouts—Investigations—Consultations—Reports—Market Investigations—Consultations in all phases of Food Preserving by Heat, Drying, Freezing—Consultation in Managing, Warehousing, Distribution—Control and Time Studies.

206 W. 57th St., N. Y. 19, N. Y., Circle 6-0785-6

READERS
May Contact
The Consultants
Whose Cards Appear on This Page

with the confidence justified by the offering of these special services nationally.

MODERN VINEGAR SERVICE

Large recirculating vinegar making units to fit any requirements. Design, Installation, Operation, Alterations, Consultation.

P. O. Box 103, Station M
Los Angeles 32, Calif.

P. W. PUNNETT, Ph. D.
Consulting Food Chemist

Research — Analysis — Surveys
Quality and Sanitary Control
Tea and Coffee Specialties

318 Allaire Ave. — Leonia, N. J.

GUSTAVE T. REICH
Consulting Chemical Engineer

Development Continuous Processes
Carbohydrate Industry — By-Products
Plant Design — Waste Disposal
Carbon Dioxide

Packard Building — Philadelphia 2, Pa.

SAMUEL P. SADTLER & SON, INC.
Established 1891

PHILADELPHIA HEADQUARTERS
FOR AGGRESSIVE FOOD RESEARCH

2100 Arch Street — Phila. 3, Pa.

SCHWARZ LABORATORIES, INC.

Chemical and biological analyses of food materials and products. Food plant design, inspection, process examination and control. More than 75 years of experience serving the food and beverage industries.

Write for bulletin
"Scientific Quality Control of Foods and Beverages"

202 East 44th St. — New York 17, N. Y.

FOSTER D. SNELL, INC.
Research Chemists and Engineers

A staff of 75 including chemists, engineers, bacteriologists and medical personnel with 10 stories of laboratories and a pilot plant are available for the solution of your chemical and engineering problems. Write today for Booklet No. 13. "The Chemical Consultant and Your Business"

29 West 15th St. — New York 11, N. Y.

CARL A. STEVENS
Professional Engineer

Investigations — Designs — Engineering for Manufacturing and Processing Plants in OKLAHOMA AND THE SOUTHWEST

Special Service to Small Industries

3012 E. 15th Street — Tulsa 4, Oklahoma

JOHN I. THOMPSON & CO.
Consulting Engineers to the Food Industries

Mechanical Management and Process Engineering. Investigation and Reports. Plant Layout and Design. Methods and Procedures.

912—17th St., N. W. — Washington, D. C.

DONALD K. TRESSLER & ASSOC.
Food Technologists and Engineers

Specialists in Food Preparation and Preservation; Equipment Testing and Evaluation; Food Freezing; By-Product Utilization; Manufacture of Pure Fruit Flavors.

North Compo Road — Westport, Conn.

James F. Walsh & Associates
Consulting Chemical Engineers and Food Technologists

Complete Analytical, Research & Pilot Plant Facilities: For the Carbohydrate and Allied Trades—Foods, Processes, Improved and New products—General Analytical Work. Investigation of new products and processes.

OFFICES AND LABORATORIES
345 West 14th Street
Holland, Michigan

EASTERN ASSOCIATES
Meyer Moskowitz
35 Nagle Avenue
New York 34, New York

A. WEISSELBERG, M. E.
Designers of Special equipment and complete plants

Quality Dehydration and Conditioning a specialty

Established 1930

31-04 Northern Blvd. — Long Island City, N. Y.

WISCONSIN ALUMINI RESEARCH FOUNDATION
Laboratory Services

Vitamin Assays
Mineral Determinations
Food Bacteriology
P. O. Box 2059
Madison 5, Wisconsin

THE REAL *VALUE*

of placing your unusual problem in the hands of a competent consultant is that it eliminates the elements of chance and uncertainty from the problem and provides real facts upon which to base decisions.

DING'S *Perma-Pulley*

PROTECTS MACHINERY
PREVENTS FIRES
KEEPS PRODUCTS PURE

Constant power . . . tremendous surface strength . . . no "dead spots" . . . that's your insurance against tramp iron damage. The Dings Perma-Pulley is completely automatic and trouble free . . . just install it and forget it. NEW BULLETIN gives complete details.

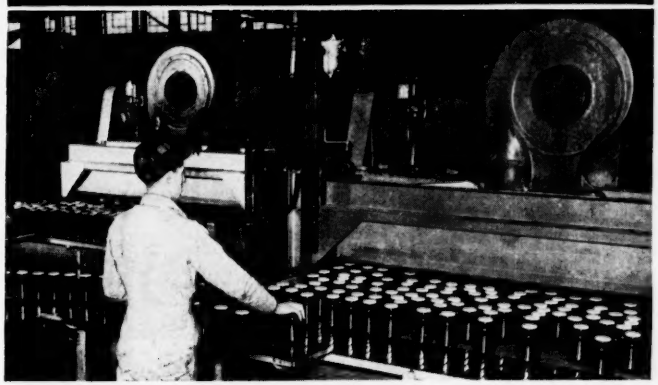
For extra heavy burden depths, use Dings Electromagnetic Pulleys. Whatever your requirement, Dings has the best magnet for the job, either electro or permanent. Write today.

- **Most powerful non-electric pulley on the market**
- **No wiring — no electrical accessories**
- **Simple to install**
- **No operating cost**
- **No maintenance**
- **Made of extra high strength Alnico**
- **Magnetic permanence guaranteed for life of installation**

DINGS MAGNETIC SEPARATOR CO.
4741 W. McGeogh Ave., Milwaukee 14, Wis.

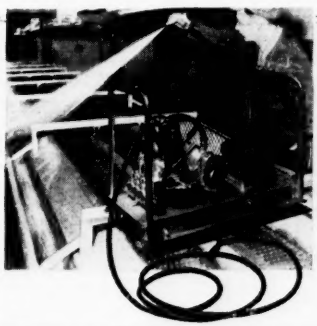
Dings
"HIGH INTENSITY"

How Farquhar Breaks Food Processing Bottlenecks



Farquhar Spray Coolers eliminate *your* cooling bottlenecks in one fast operation . . . save time and money. First two heads spray hot water to temper glass; remaining headers use tap water. Both hot and cold water are *recirculated*, assuring minimum water consumption! And *Farquhar Pasteurizer-Coolers* further speed up processing . . . eliminate handling . . . do combination job in *one operation*, saving manpower and increasing production!

Farquhar Hi-Pressure Cleaning Units keep processing equipment clean, ready to work. Ideal for hard-to-clean equipment because high-velocity jet of hot or cold water (300 to 500 lbs. p.s.i.) quickly dislodges refuse, residue from vats, cooler, belts, tanks, etc., . . . flushes equipment *clean* faster, easier, better!



For All Your Processing Problems

Farquhar Spray Coolers and Pasteurizer-Coolers operate at any required speed to assure your plant maximum protection . . . are built in various sizes to handle any processing volume. Farquhar Hi-Pressure Cleaning Units are available in portable or permanent installations in two sizes: *10-gallon*-per-minute pump, one gun; *20-gallon*-per minute pump feeding two guns simultaneously. *To get all the facts* about Farquhar Food Processing Equipment, check and mail the coupon below.

Farquhar
FOOD PROCESSING MACHINERY

A. B. Farquhar Co., *Special Machinery Div.*, 1202 Duke St., York, Pa.
Send me complete information on Farquhar Spray Coolers ☐; Hi-Pressure Cleaning Units ☐; Juice Presses ☐.

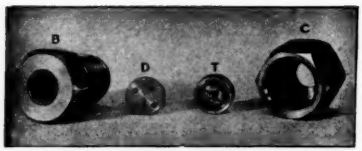
NAME ..... COMPANY .....
ADDRESS ..... CITY ..... STATE .....

JUICE PRESSES • SPRAY COOLERS • CLEANING UNITS • TRIMMING TABLES • PASTEURIZER-COOLERS • CONVEYORS

Have you tried Monarch H-466 *Carbaloy Cemented Carbide nozzles?*

Drying work, and for extra long life, the parts subject to wear or erosion are made of Carbaloy Cemented Carbide. Other parts are made of 18-8 stainless steel to resist corrosion.

Plants powdering milk, eggs, coffee, molasses, etc., report nozzle life of 50 to 100 times that of nozzles of ordinary materials. Think of the savings resulting from the elimination of "down" time alone!



MONARCH MFG. WORKS, INC.
2517 E. Ontario St. Philadelphia 34, Pa.

The Latest News of Science Now Yours in One Big Magazine!

Now at last you can keep up with the new inventions and discoveries of science that affect you and your industry. Every month *Science Illustrated* is filled with new advances in vital fields... Electricity, Construction, Aviation, Atomic Energy, Radio, Synthetics, Mining, Chemistry, Electronics, Home Appliances, etc.

Science Illustrated shows you new products and designs and explains *why*, *when* and *how* they were made. Every monthly issue is packed with 30 complete, authentic articles and 140 photographs, diagrams.

ORDER NOW AND SAVE $4!

You can order 36 big issues of *Science Illustrated* (3 full years) for ONLY $5! This special rate *saves you $4* over the one-year price. We'll start your subscription with the big new issue now on the press—*if you order within 10 days!*

MAIL THIS ORDER FORM TODAY!

Science Illustrated
330 West 42nd Street, N. Y. 18, N. Y.

YES! I accept your special offer. Start my subscription to Science Illustrated with the new issue now on press.

☐ I prefer 2 yrs. at $4 (Saves me $2 compared with the 1-yr. rate)
☐ I prefer 3 yrs. at $5 (Saves me $4)
☐ I prefer 1 yr. at $3
☐ Bill me later ☐ Payment enclosed

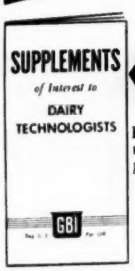
Name_____
Address_____
City_____ Zone____ State____

ALSO ON SALE AT ALL NEWSSTANDS 25¢

FI-3-49

INGREDIENTS
FOR THE FOOD PROCESSOR

A BOOKLET YOU WILL WANT



Filled with suggestions covering the production and quality control of cultured dairy products, ice cream and vitamin fortified milk, butter and cheese.

Write Today—Ask for
CATALOG No. 277
GENERAL BIOCHEMICALS, INC.
50 LABORATORY PARK — GBI — CHAGRIN FALLS, OHIO
Reg. U. S. Pat. Off.

CARROT OIL makes foods golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.
Carrot oil is preferred for vitaminising foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET
New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

NEW ADVERTISEMENTS

must be received by March 21st to appear in the April issue.

Address copy to the
Classified Advertising Staff
FOOD INDUSTRIES
330 West 42nd St., New York City

WHERE TO BUY

Featuring additional Equipment, Materials and Supplies for the Food Processing Industries.

MARSH STENCIL MARKING

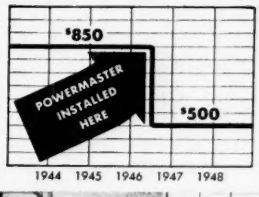
SPEED shipments to your customers. Save $50 a month with Marsh Stencil Machines, Brushes, Inks! Electric and Hand Operated machines cut ½", ¾", 1" letters. For sample stencil, Shippers' Handbook, prices, pin this to business letterhead with name.

MARSH STENCIL MACHINE CO.
48 Marsh Building • Belleville 111, U. S. A.

KIWI CODE DATER

Clamps on any conveyor. Top, side or bottom. Automatic, Unconditionally Guaranteed. Economical, Accurate, Neat. Write for Details.
KIWI CODERS CORP.
3804 No. Clark St. Chicago, 13, Ill.

Powermaster Steam Generator Chops Steam Costs MORE THAN 40%!



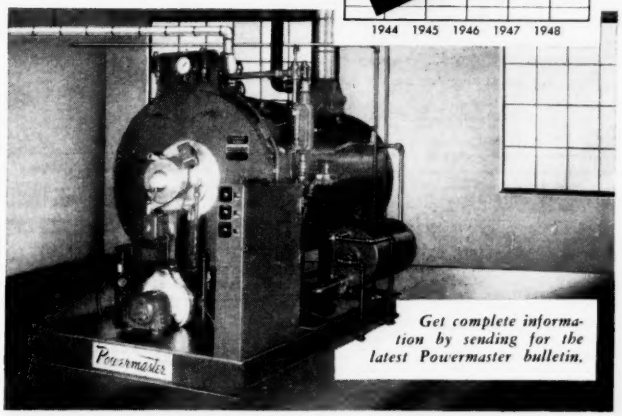
MASTER Dyeing Company reduced their steam costs by $350 *per month* when they installed a 150 HP heavy oil-burning Powermaster at their model plant in Astoria, New York.

Before the steam generator was installed, the monthly steam bill ran about $850—now it amounts to about $500 for all expense.

Beside the money saved, the new Powermaster has made Master Dyeing Company's boiler room a *clean* and *comfortable* place. There are no ashes—no smoke—no wasted heat in the boiler room.

Then too, the boiler maintenance man at Master Dyeing has had his hands freed for other duties. Powermaster operation is *fully automatic* and requires very little of the operator's time.

You can burn light oil, heavy oil, gas or a combination of these three fuels with the new Powermaster. It is a completely equipped steam plant. Wired, piped, insulated and tested at the factory. Delivered as a single unit, quickly installed at minimum cost. Available in sizes from 15 HP up.



Get complete information by sending for the latest Powermaster bulletin.

ORR & SEMBOWER *Powermaster*® **STEAM GENERATORS**

ORR & SEMBOWER, INC., 940 MORGANTOWN ROAD, READING, PA., U.S.A.

-for Cleaning Problems in FOOD PROCESSING it's PERMAG

Every food processing industry requires a Cleaning Compound that removes all unwholesome contaminations, food residue, and foreign soil quickly and efficiently.

BAKERIES - DAIRYING ESTABLISHMENTS - PACKING PLANTS - RESTAURANTS and HOTELS are but a few constant users of PERMAG Cleaning Compounds.

PERMAG Compounds are safe, economical and ideal for cleaning all types of metal utensils used in handling and preparing food.

If you have a cleaning problem let our Technical Specialists help you. Write us • No obligation for interviews.

Magnuson Products Corporation

Mfrs. of Specialized Cleaning Compounds for Industry

50 COURT ST. BROOKLYN 2, N. Y.

In Canada: Canadian Permag Products Ltd., Montreal

• • **PERMAG** • •

More than 340 Cleaning Compounds are now made under the PERMAG trade name to meet the growing demands of industry.

CASE HISTORY #

The .....Co., nationally known manufacturers of food products, needed additional package production.

Plant space was at a premium, and, all available personnel were required for current production.

THE EDLAW CO. was contacted—A test production line was set up —Costs calculated— and regular production was started WITHIN 48 HOURS.

FIVE MILLION 4 oz. packages have been added to this company's production in the last 12 months.

FOR CONTRACT PACKAGING AT PREDETERMINED COST

Pin this to your letterhead

THE EDLAW CO.

88-61 76th Ave. Glendale 27, N. Y.
Kindly contact our
Mr.....
.....
.....

SEARCHLIGHT SECTION

LARGE CHEMICAL MANUFACTURER SEEKS A

Food and Beverage Industries Sales Manager

who is experienced in promoting and making sales of bulk materials to millers, bakers, canners, bottlers and other manufacturers and processors of foods and beverages. Must have record of accomplishments and be known favorably by important buyers. Age 34-45. Location New York area. Initial salary $12,000-$15,000 with substantial opportunities for future. Reply in confidence to

Box 226, Church Street Station, New York 8, N. Y.
DESK 6-F

ATTENTION SALES MANAGERS OR ASSISTANT SALES MANAGERS

Here's an opportunity for a reliable, capable, energetic individual who knows he has the ability and that he can deliver the goods as a Sales Manager for a long-established food manufacturer serving the western half of the United States.

You will have a future here—Salary—Bonus—and other incentives as well as an opportunity to put your ideas across.

Write

P 8046, Food Industries
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED: AN Assistant for important liquor manufacturer. Must possess at least elementary knowledge of chemistry and experience in handling men. Also keen sense of smell and taste. Give full details of past experience, age, etc. Salary and future consistent with knowledge, experience and dependability. All information will be kept strictly confidential. P-8059, Food Industries.

EXCELLENT OPPORTUNITY for Food Technologist with outstanding Eastern Frozen Foods packer. Give personal data, training, experience and qualifications in first letter. Reply P-8049, Food Industries.

SELLING OPPORTUNITY OFFERED

WELL-KNOWN British Food distributors with national sales force desire to contact manufacturers of all types of food products in cartons or cans who are interested in selling their goods in the United Kingdom. We prefer to deal with smaller manufacturers producing best quality foodstuffs who have original ideas on marketing and who will be guided by our experience of the British market. Please write full details to RW-6987, Food Industries.

EMPLOYMENT SERVICE

SALARIED PERSONNEL $3,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

FOOD TECHNICIAN—Thorough knowledge manufacture of natural and artificial extracts: Bottlers, fountains, bakers, confectioners, institutional supplies, location immaterial. PW-8018, Food Industries.

CHEMISTS CHEM. ENGRS.

Dir. of Development, Ph. D. $12,000
Ammes exp. Sales Minded.
Research Chem. Ph.D. ..... $ 6,500
Hi-polymer work.
Technical Sales Service. Degree ..... $ 5,000

Please write, GLADYS HUNTING.

CASTLE & ASSOCIATES, INC.
220 S. State St. Chicago 4, Ill.

BAKERY SUPPLY CONSULTANT

Available to a limited number of new accounts to teach you the Know-How in making Jams & Jellies, Emulsions, Fudges, Powdered Mixes, etc.

PW-7652, Food Industries,
520 North Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

FOOD CHEMIST and Technologist Masters Degree 7 years experience in all types of foods. Supervised laboratory. Familiar with all specifications for food products. PW-7579, Food Industries.

FOOD CHEMIST with 25 years experience in direction, development, and quality control in baking, canning, and specialty items. Seeks position as control chemist. PW-8085, Food Industries.

MECHANICAL ENGINEER, plant and maintenance, age 35, supervisory, design, layout, estimating, (board work, building and machine construction. At present in food processing, domestic or foreign, salary secondary consideration. PW-7978, Food Industries.

FLAVOR CHEMIST. Now available. 25 years experience compounding and manufacturing beverage, candy, ice cream, flavors. American Christian. Locate anywhere. Gasteyer 106 E. 16th St., Wilmington, Del.

ADMINISTRATIVE ASSISTANT: Young, Ph.D., 34, interested in learning food administration. Seven years' technical experience in Control, research, production, marketing and development. PW-8077, Food Industries.

SUPERVISORY POSITION—Dairy or Food Industry, B.S. degree, married, 31, excellent references. PW-8139, Food Industries

FOOD TECHNOLOGIST—Five years experience include quality control, process and product development in canned foods, beverages. Desires position as quality control director. PW-7910, Food Industries.

CONTROL TECHNOLOGIST—desires production or quality control position. Experience in tea, coffee, canning. Thorough technical and practical background. PW-7911, Food Industries.

SPECIALIST FISH and Meat Products packed in cans. Pickled fish European style. Also will sell formulas and give instructions. PW-8121, Food Industries.

SPECIAL SERVICE

Consulting Engineer

with many years experience Designing, Constructing and Equipping modern food plants. Available for limited engagement with small associate staff of specialists to survey production facilities and prepare report plant status. Qualified to analyze and review contemplated program of new construction, expansion or rehabilitation and submit independent and unbiased recommendations depicting feasibility of project after consideration all factors. Highest credentials. SS-7907, Food Industries.

INTERNATIONAL FOOD BROKERS

184 North 8th St. Brooklyn 11, N. Y.

Over 30 years in Metropolitan New York and New England. Selling raw materials, institutional and consumers products. Warehouse facilities. Food technologist on staff.

COURSES IN FOOD TECHNOLOGY

MEN OR WOMEN

Fundamentals and laboratory work in Canning, Freezing, Preserving, Science of Nutrition, Food Analysis, Mold Counting, Menu Planning. Night classes. Veterans paid while learning.

MIAMI SCHOOL
FOR FOOD PROCESSING SPECIALISTS
Box 383, Coral Gables 34, Florida

BEWARE THE IDES OF MARCH!
BUY WHERE THE "ADS" SAY—

MAHONEY FOR MACHINERY

NEW—USED—REBUILT

A NEW HIGH IN PERSONAL SERVICE

"Machinery Shopping" for the Busy Plant Executive. We locate equipment you need or buyer for your surplus. "Finder's Fee" Basis.

PROCESSING - PACKAGING MATERIALS HANDLING

982 Stuyvesant Ave. Union, N. J.

SPECIAL SERVICE

HIGHEST EFFICIENCY EDUCTORS — EJECTORS—PROPORTIONERS and Venturi devices for creating vacuums, etc. Top performance against high heads. No expensive, complicated mechanism necessary. Custom built to solve your specific problem. Will move or mix all fluids accurately. Excellent Navy rating.
ALADDIN PROPORTIONING EQUIPMENT CO.
119 West 57th Street, New York 19, New York

WANTED

Large engineering firm wishes to acquire several complete food plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.

Box 1219, 1474 Broadway, N. Y. 18, N. Y.

GET MORE FOR YOUR SURPLUS EQUIPMENT

List it with our bureau
And Sell Directly to the next user

50,000 Manufacturers Get Our Offerings Regularly. They need such units as:

LABELERS	DICERS	PEELERS
RETORTS	WASHERS	KETTLES
DRYERS	STILLS	MIXERS

or what have you to sell?

For Quicker Action and Better Price Send Full Details and YOUR price to

EQUIPMENT FINDERS BUREAU
6 Hubert Street New York 13, N. Y.

WANTED

Can Making Machinery

Complete line of Can Making Machinery for No. 2 Standard Can.

W-8175, Food Industries
330 West 42nd Street, New York 18, N. Y.

WANTED

New or Used Whipped Cream Machine approximately five gallon capacity. Prefer tank mounted on motorized base. Please send all details & specifications to

P. O. Box 7559—Phila. 1, Pa.

FOR SALE
PROCESS EQUIPMENT

1—19½" dia. x 15" deep stainless steel kettle ⅝" thick with bolted-on cover.
1—5' x 5' x 42" JENSEN coil pasteurizer (tinned copper kettle) with agitator coil. 650 gallons capacity.
3—Small Paul O. Abbe laboratory size pebble mills.
2—50 gallon jacketed, agitated open top kettles.
3—65 gallon jacketed DOPP kettles—New, with hinged steel covers.
1—Charlotte stainless steel laboratory Colloid mill with 1 HP A. C. motor.
1—12" x 30" Kent 3 roller water cooled mill.
1—16" x 40" Day 3 roller water cooled mill.
3—12" x 30" Lehman 5 roller water cooled mill.
1—"Ceco" Automatic Carton Sealer Model A-3901-12 with motor drive.
1—Western Bear Cat shredder, size 2A
4—24" x 48" (12 cu. ft.) single ribbon and paddle mixers with A. C. motors.
1—Buffalo double drum dryer 32" D x 90" long.
1—20 gallon (5 blade-paddle type) Stokes tilting type mixer.
1—J. H. Day 6 barrell "Hercules" tilting type mixer with A. C. motors.
1—24" x 24" Sperry C. I. open delivery plate and frame filter presses.
1—7 HP Kane high pressure fire tube gas fired boiler.
1—Norge "FASTEMP" model FH 55 AS room or space heater. For use with #1 or #2 oil.
1—Readco 100 gallon sigma blade heavy duty jacketed tilting type mixer.

Distributors for Crocker-Wheeler electric motors & generators

Also a full line of pumps, tanks of all kinds, kettles, scales, etc.

Ask for latest stock sheet "H"

Emsco Equipment Company
Affiliate of Emil A. Schroth
51 Hyatt Avenue, Newark 5, N. J.
Phone—Mitchell 2-3536

FOR SALE

24"x20" Buflovak Vacuum Drum Dryer.
32"x52" Buflovak Double Drum Dryer.
100 and 200 gal. S.S. Mix Tanks, water jkt.
3—200 gal. S.S. Vert. Tanks, insul., agit.
400 gal. S.S. Tank, with S.S. Coil.
40 gal. S.S. Clad, also Alum. Kettles, jkt.
60 & 150 gal. Copper Jkt. Kettles.
100 to 330 gal. Pfaudler Tanks, water jkt., agit.
2000 & 3000 gal. Pfaudler Tanks, agit.
Hobart Mixer, 3 Speed, 2 HP.
75 to 1000 gal. Homogenizers or Viscolizers.
Nos. 10, 25 & 55 Waukesha Nickel Alloy Pumps
Nash "Hytor" Vacuum Pump, 5 H.P. motor.
3' to 6' S.S., also Copper Vacuum Pans.
1½" Tri-Clover S.S. Centrif. Pumps, ¾ H.P.
Nes. 1 gal. Laboratory Autoclaves.

Send us your inquiries.

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street, New York 17, N. Y.
MUrray Hill 2-4616

FOR SALE

Miller Cellophane Box Wrapper & Sheeter.
75 gal. Copper Steam Jacketed Kettle.
80-qt. Read and Triumph Mixers.
16" and 20" Buffalo Food Choppers
Buffalo Food Grinder with 8½" plates.

SAVAGE BROS. CO.
2638-46 Gladys Ave., Chicago

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO.
PHILADELPHIA, PA
3 WAREHOUSES
Proper Temperature for Frozen Foods

FIRST FACTS
in the Processing Industries

FMC has the answers to your questions:
Where can I get that machine?
How do they process this?
Is there equipment to do this?
Can I get a complete plant to do this?
Our Research Dept. is at your service.

FOOD and CANNING EQUIPMENT

For IMMEDIATE DELIVERY

COOKERS - EVAPORATORS - VACUUM PANS

40—Steam Jacketed Kettles in Stainless, Aluminum or Copper (some with agitators) up to 500 gallons.
25—Vacuum Cookers, jacketed or coiled in copper, stainless and steel—50 to 1000 gallons.
4—Pfaudler Glass Lined Vacuum Cookers, coiled or jacketed; with agitators, 500 gallons to 2500 gallons.

RETORTS AND STERILIZERS

35—Standard F.M.C. or Robins 40" x 72" Retorts with crates and instruments, complete, vertical or horizontal; larger horizontal Retorts up to 18 ft. long.

DRYERS AND DEHYDRATORS

2—Stainless Steel Atmospheric Drum Dryers, 5' x 10'—Other single and double drum Dryers in cast iron up to 4' x 9'.
6—Steam Tube Dryers by Louisville, Davenport and others, up to 50' long.
3—Rotary Vacuum Dryers, 3' x 20', 5' x 10' and 5' x 33'.
4—Proctor & Schwartz Conveyor and apron Type Dryers, up to 72' long.

COOKER — COOLERS — EXHAUSTERS

1—Anderson-Barnsgrover Continuous Cooker—4' x 4' x 12', 600 can capacity, No. 2's.
1—Cooler—125 can capacity.
1—Anderson-Barnsgrover Cooler, 4' x 4' x 10', for 2's and 2½'s.
2—United Exhausters, 4' x 10'.
1—Anderson-Barnsgrover Exhaust Box, 22 ft. long.
1—Atlas 450 can Exhaust Box—25 ft. long.
3—F.M.C. Peerless Style C, No. 5 Rotary Exhaust Boxes.

PASTEURIZERS — HEAT EXCHANGERS

2—Chisholm Ryder Stainless Tubular Heat Exchangers, 10' long—Model 51.
2—CRCO American Vac Type Pre-Heaters in stainless, 15' long, Model V.
3—Cherry-Burrel Pasteurizers, nickel tubes, 6' long, 8 high.
6—Sets of Kook-More Coils in copper or stainless.

PULPERS — FINISHERS — JUICE EXTRACTORS

6—Stainless Juice Extractors, Model B—CRCO; 4 in nickel.
4—Indiana Pulpers, bronze, No. 112-119.
5—Food Machinery Co. Pulpers, Models #50-100.
6—Langsenkamp Brush Type Finishers.
5—CRCO Tomato Choppers and Pre-Heaters.

COLLOID MILLS— HOMOGENIZERS —VISCOLIZERS

1—Cherry-Burrell Sanitary Stainless Viscolizer, 800 GPH.
2—Union Stainless Steel Viscolizers with 20 HP motors, 800 GPH.
8—Marco Flow Master Homogenizers, all sizes.
24—Eppenbach, Charlotte, Premier, U. S. Gaulin and other standard make Homogenizers from Lab. size to 50 HP.

FILTERS AND FILTER PRESSES

7—Ertel, Alsop, Star Disc Filters, single and multiple in bronze, nickel and other non-corrosive contact parts.
38—Filter Presses by Shriver, Sperry, Johnson in wood, cast iron, bronze, etc.

FILLING EQUIPMENT

15—Vacuum Fillers, rotary and straight line by Kiefer, Pneumatic Scale, FMC, Horix, etc.
12—FMC, Berlin Chapman, Horix, Haller Juice Fillers.
4—FMC and Chisholm-Ryder Stainless Hank Pack Fillers for No. 2's and 10's.
5—M & S 6 pocket Fillers.
12—Piston Type Fillers from single to 11 pistons by Filler Machine Co., Elgin, and Pfaudler.
25—Dry Powder Fillers by Stokes & Smith, Pneumatic Scale, Triangle, National Packaging and others.

LABELLING EQUIPMENT

20—World, Ermold, New Jersey semi-automatic Labelers.
12—Fully automatic Pneumatic Scale, World, New Jersey and others.
10—Can Labelers by Standard Knapp, Burt, Nu-Way, Chisholm-Ryder and others.
6—Can Casers, state size and pack required.

MISCELLANEOUS

Centrifugal Extractors
Rietz and Fitzpatrick Disintegrators
Hercules Ice and Bone Choppers
Urschel and Sterling Dicers—Cutters
Meat Mixers, Grinders, Choppers
Washers, Peelers, Cutters, Grinders
Equipment for Corn, Peas and Beans, Pumpkin

PLANTS FOR SALE

Brewery - Distillery - Winery
Vegetable Processing, Packing
Meat and Poultry — Packing
Vegetable Oil Extractor
Macaroni - Spaghetti
Peanut Butter - Salad Dressing
Citrus Fruit Packing

Nobody pays more than F M C for Good Used Equipment

FIRST MACHINERY CORP.
157 HUDSON ST. WOrth 4-5900 NEW YORK 13, N. Y.

"Consolidated" OFFERS

DRYERS

1—Buffalo, Vacuum Shelf, 60"x80", 20 shelves
1—Louisville Steam Tube, 6'x50'
1—Direct Heat Rotary, 3'6"x28'
1—Rotary Vacuum, 5'x33'
1—Buffalo, Double Drum Atmos., 32"x72"
2—Buffalo 32x90 Atmos. Double Drum, 20 HP AC Motors

FILTERS

1—#12 Sweetland 4" centers, iron or copper leaves
1—#10 Sweetland 2" centers, iron or copper leaves
1—#5 Sweetland 2" centers, copper leaves
1—8x12 Oliver Acid Proof Filter
3—36" Sperry 60 plate cast iron, Recessed center feed, open delivery, hydraulic closing

MIXERS

2—Baker Perkins size 17, jacketed, 200 gallon working capacity
1—W&P Size 16, unjacketed, 150 gal. working capacity
8—Baker Perkins size 15, jacketed, 100 gal. working capacity
1—W&P Size 12, jacketed, 20 gallon working capacity
1—1000# Stedman Drum Mixer, M.D.

KETTLES

3—7500 gal. Steel, with copper coils, closed, Agitated, 10' dia. x 12'6" deep, 15' overall height
1—2000 gal. Steel, Jacketed, open top, Agitated, 7' dia. x 7'6" deep
1—1200 gal. Aluminum Kettle, Jacketed, Closed, 5' dia. x 8'6" deep
20—250 gal. Copper, Jacketed, Open top, with stands, 50" dia. x 42" deep
1—700 gal. Steel Jacketed, open top, non-agitated
1—550 gal. Steel Jacketed, open top, non-agitated
1—500 gal. Aluminum, jacketed, closed, Agitated
1—500 gal. Stainless Steel, jacketed, closed, Agitated
2—Pfaudler 350 gal. glass lined, jacketed, Agitated
1—200 gal. Steel Jacketed, open top, Agitated
24—150, 80, 60, 40, 20 gal. Aluminum, jacketed

MISCELLANEOUS

2—48" Troy Steel Basket Centrifugals, with V-belt Motor Drive
1—Ball & Jewell #1 Rotary Cutter
1—Eppenbach Size B Sanitary vertical Colloid Mill, w/c. s/s, 2 HP Motor
1—#4th Mikro Pulverizer
1—K.K. Piston Visco Filler, #2
1—Standard Knapp #429 Auto. Gluer and Sealer
1—Stokes #15 Auger Powder Filler
1—Mojonnier type 6'6" dia. Copper Vacuum Pan
1—Knapp Model 3B, Can Labeler
2—World Rotary Automatic Labelers
1—York 6"x6" Refrig. Unit, 20 HP Motor

ONLY A PARTIAL LISTING

THE KEY TO SAVING TIME AND MONEY
CONSOLIDATED PRODUCTS COMPANY, INC.

13-17 Park Row New York 7, N. Y.
Shops: 331 Doremus Ave., Newark 5, N. J.

FOR SALE—MODERN PACKAGING EQUIPMENT

PNEUMATIC 60 Per Min. Fully Automatic Cartoning Line, Automatic Feeder, Bottom Sealer, Filler, Top Sealer and Compression Unit.

PNEUMATIC SCALE CO. 35 Per Minute Fully Automatic Cartoning Line, Automatic Feeder, Bottom Sealer, Filler, Top Sealer and Compression Unit.

PNEUMATIC SCALE CO. Wax Inner Liner.
PNEUMATIC SCALE CO. Automatic Combine Top and Bottom Sealer and Filler. 60 per minute.
PNEUMATIC 4 Scale Net Weight Filler.
PNEUMATIC SCALE TOP TUCKER for Cartons.
STOKES & SMITH Transwraps. Model A-AA-B.
RESINA, Automatic Capper.
CAPEM 4 Head Automatic Capper.
FILLER 2 Spout Stainless Steel Piston Filler.
STOKES & SMITH, Model HG84, Duplex Vacuum Auger Filler.
STOKES & SMITH, Model G, Auger Fillers.
TRIANGLE Top and Bottom Carton Sealer with Compression Unit. For large size cartons.
JOHNSON Automatic Feeder and Bottom Sealer. 80 per min.
JOHNSON Combine Top and Bottom Carton Sealer with 3 spout Net Weight Filler.
PACKOMATIC Cartoning Unit, 8" and 12" sizes. Bottom Sealer, Filler, Top Sealer.
LEHMANN Automatic Envelope Filler & Sealer.
WHIZ PACKERS, with Agitators.
AMSCO Rotary Heat Sealers.
CHAMPION Wire Staplers.
STANDARD KNAPP Case Sealer, Model 429.
WORLD Fully Automatic, Straightaway Labeler.
WORLD & ERMOLD Spot Labelers.
STANDARD KNAPP Can Labelers, No. 2 to 10.
NEW JERSEY MACHINE CO. Pony Labelrite Labelers, Model ML, and MX.
CECO 12" Adjustable Top and Bottom Sealers.
MILLER WRAPPER AND SHEETER.
POWDER MIXERS & Sifters, 200 to 1,000 lbs.
PACKAGE MACHINERY F-6 and F-9 Wrappers, Sheet and Roll Feeds.
LEHMAN, 12 x 24", 3 Roller Granite Mill with 7½ HP silent chain drive.
COLTON Tablet Machines Model 3DT.

WANTED
Single Machines or Entire Plants

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone Yonkers 5-2997

WE CAN FURNISH AT ANY POINT NEW AND USED TIGHT AND SLACK BARRELS AND STEEL DRUMS, PAILS AND KITS. LET US HAVE YOUR INQUIRIES.

BUCKEYE COOPERAGE CO.
3810 Orange Ave., *EXpress* 3383, Cleveland 15, O.

FOR SALE

1 Monitor tomato washer
1 New peach washer, scalder, slicer and enclosed type tubular pasteurizer, all F.M. make
2 Fay & Scott strawberry cappers in excellent condition
1 Selectro 18 x 60 vibrating screen.

Also the following motors:

1 Westinghouse 220-V. 20 HP
1 GE 220-V 15 HP
1 220-V 30 HP
1West. 200-V 20 HP, double shaft
1 West. auto starter 220-V 20/30 HP
1 250-V 400 Amp. 3-pole Trumbull, Type "A" switch, 3 fuses.

Write or Phone

Sunshine Packing Corp. of Penn.
North East, Pa. PH. 361

FOR THAT 1949 BUDGET!

We can save you money! Get our 8-page 1949 Catalog "M" of Processing & Packaging Equipment—hundreds of items, many located in your own neighborhood.

HORNE MACHINERY CO., Inc.
1188 Harrison St., San Francisco 3, Cal.

FOR SALE

1—Stainless Steel Closed Storage Tank—10'6" x 20', 13,000 gals.
1—Vertical Stainless Steel Storage Tank, 7' x 7', 2000 gals.
28—New Hubbard 100 gal. Stainless Clad Jacketed Kettles.
1—Glasscote 250 gal. Glass Lined Reactor.
1—Glasscote 300 gal. Glass Lined Vac. Receiver.
1—Stokes 30"x8' Rotary Vacuum Dryer.
4—Stainless Steel 48" Sus. Style Centrifuges—Imperforate & Perforate Baskets.
1—Standard Knapp Fully Adj. Can & Bottle Labeler.
3—W. & P. Mixers—2, 5 & 15 gals.
1—W. & P. Jack. Mixer, 100 gallons.
2—Abbe 6' x 8' Buhrstone Lined Mills.
1—Patterson Silex Lined Pebble Mill, 54" x 60".
4—Day & Ross 20 & 40 gal. Pony Mixers.
10—Horiz. Spiral Mixers 25# to 3500#.
4—Vac. Shelf Dryers—Lab. to 20 Shelf.
New Stainless Steel Jack. Kettles, Tanks, Agitators, Conveyors. We buy your surplus.

Send For Bulletin A-22

THE MACHINERY & EQUIPMENT CORP.
533 West Broadway
New York 12, N. Y. Gr. 5-6680

ACTIVATED CARBON

Approximately ½ million pounds of highly activated shell and pit carbon, 300,000 pounds of which is 30 to 100 mesh and the remainder pulverized. Carbon is ideal for the control of color and taste, and is manufactured by the same process as our gas mask carbon.

Inquiries and bids are solicited on all or part of the above. Samples on request.

ATLAS CARBON AND CLAY CORP.
7425 Sunset Blvd. Los Angeles, 46, Cal.

FOR SALE

DEPOSITOR, FILLER MACHINE CO. MODEL "W" 10-CYLINDER. USED ONLY A VERY SHORT TIME. REASON FOR SELLING, DOES NOT FIT OUR PRODUCTION.

DAVIDSON BAKING COMPANY
P. O. Box 4167 Portland, Oregon

BOTTLING MACHINERY FOR SALE

6 Fillers, Internti. straight-line, 60 b/m.
2 Resina automatic screw-cappers, 60 b/m., 1 new.
6 Corkers, Machinery Service Co., automatic 60 b/m., 1 new.

CONTINENTAL DISTILLING CORP.
1429 Walnut St., Phila. 2
Att: F. Lehman

FOR SALE

STERILIZER

One Walker-Wallace Tomato Juice Sterilizer with 54 Stainless Steel Grooved Plates. This is complete with circulating pump and all controls. Used one season.

P.O. Box 87, Benton Harbor, Michigan

PITCO FRIALATOR

One new, never used at only $750.00. The large, 24 x 54 Heavy Duty Type. Write or wire

C. E. PAGE
710 No. Cogswell Road El Monte, Calif.

Rebuilt Processing Equipment

IMMEDIATE DELIVERY—GREAT SAVINGS

UNION Rebuilt Machinery Established 1912

Mikro 24", 1-SH and Bantam Pulverizers, Jay Bee Mills—U-1, 3AT, Schutz-O'Neill, Fitzpatrick Comminuters.

Baker Perkins and Readco Heavy Duty 100 and 150 Gallon Double Arm Jacketed Mixers with Sigma or Fish Tail Blades.

Stokes, Day, New Era, Hottman Mixers, 2 to 3500 gal. with & without Jackets, Single and Double Arm Agitators.

Day and Robinson 100, 400, 600, 1000, 2400 and 4000 lbs. Dry Powder Mixers & Sifters.

Gayco 8 ft. air Separator, Robinson #31 and Schutz-O'Neill #3 Sifters.

Ross, Kent and National Equipment, Steel and Granite, Three-Roll Mills.

Buflovak, Huhn, Wolfe and Ellis Steam and Gas Fired Dryers.

Vacuum Pans with and without Heavy Duty Agitators, 20", 3', 4', 5' and 6'.

Lee Metal 125, 200, 250 gallons Stainless Steel Jacketed Kettles, 50 gallon Tilting type with Agitator.

Horix, MRM, Mojonnier and Elgin S.S. Rotary Fillers; Kiefer Single and Bagby Twin Piston Fillers, Bottom Feed.

Pony Labelrite, Ermold and World Semi-Automatic, and Fully Automatic Rotary and Straightaway Labelers.

Burt Automatic Wraparound Labeler.

Pneumatic Scale Single Head Automatic Capper.

Stokes and Colton Late Style Rotary Tablet Machines: Stokes Model T.

Standard Knapp #429 and J. L. Ferguson Carton Sealers.

Stokes and Smith G1, and Duplex Automatic Auger Powder Fillers.

Sperry, Shriver, Sweetland, Vallez and Johnson Filter Presses, all sizes.

Package Machinery FA, FA2, Hayssen and Miller Automatic Wrappers.

Urschel #6 and Anderson #3 Dicers.

Pneumatic Automatic Carton Lining, Filling, and Sealing Machine.

Pneumatic Scale, 4 Head Automatic Net Weigher.

PLANTS AVAILABLE

Peanut Butter—Macaroni

Anderson Expeller

MANY OTHER ITEMS OF INTEREST IN STOCK—FULLY GUARANTEED

Write, Phone, Wire Collect For Details and Prices

Union STANDARD EQUIPMENT CO.
318-322 LAFAYETTE ST., NEW YORK 12, N.Y.

PREMIUM PRICES PAID FOR YOUR SURPLUS EQUIPMENT

EQUIPMENT

FOR FOOD AND PROCESS INDUSTRIES

2—Buffalo Vacuum Shelf Dryers, double door, 12 & 15 shelves.

1—Buffalo single-door Vacuum Shelf Dryer, 17 shelves.
2—Louisville Rotary Steam Tube Dryers, 6' x 50'.
1—Louisville Rotary Steam Tube Dryer, 54" x 30'.
1—Fitzpatrick Stainless Steel Comminuting Machine, Model D, with 5 HP Motor.
1—Mikro Pulverizer #2TH.
1—Shriver 36" x 36" plate & frame Filter Press, rubber covered.
2—Shriver Filter Presses, 42" x 42", 46 chambers, plate & frame, with hydraulic closing device.

R. GELB & SONS, INC.
Est. 1886 UNionville 2-4900 UNION, N. J.

FOR SALE

RICHARDSON AUTOMATIC EE37 WEIGHING SCALE

AND

G72 OSCILLATING PACKER

If your product is free flowing and your production is up to 20000 pounds per hour this equipment will enable you to REPLACE A THREE MAN CREW WITH ONE MAN. Elec: 220v-60c-3ph. Air—4-cfm at 60-psi.

JOE LOWE CORPORATION
400 W. Ohio St. Chicago 10, Ill.

Buy the Finest

"BUY BRILL"

12—Ross 2 Truck Steam Dryers, 500 sq. ft.
5—Shriver Type 42"x42" Pl. & Fr. open delivery, cast iron Filter Presses, 47 chambers, 1" cake.
3—Sperry 42"x42" Aluminum Pl. & Fr. Filter Presses, closed delivery.
1—Sperry 36" wood Pl. & Fr. Filter Press, 28 chambers making 1-$\frac{3}{4}$" cake.
5—Shriver, Sperry 30", 24", 18" cast iron P&F Filter Presses.
2—Oliver Rotary Vacuum Dryers 8'x8', 8'x12'.
5—Louisville Rotary Steam Tube Dryers, 6'x25', 6'x50'.
1—3'x14' stainless clad Steam Tube, jacketed Rotary Dryer.
1—Buflovak Vacuum Shelf Dryer having 19-42"x42" shelves.
2—Sharples #16 Vaportite Centrifuges, stainless steel bowls, motor driven.
1—Sweetland #5 Stainless Clad Filter.
15—Stainless Steel Steam Jacketed Kettles, 50 to 500 gal.
1—Stainless Steel 600 gal. jacketed, agitated, stainless steel Pressure or Reaction Kettle.
1—Struthers-Wells 400 gal. steel, jacketed, agitated Pressure or Reaction Kettle.
1—Buflovak Vacuum Shelf Dryer with 19-42"x42" shelves.
2—Kiefer Ketchup Fillers, 24 stem.
1—Robinson 20"x48" Sifter
1—Day Ro-Ball #81 all stainless steel Single Deck Sifter, 40"x120".
1—Resina LC, single head Capper.
9—Lightnin Mod. D, Agitators, 3HP
1—#2TH Mikro Pulverizer.
1—Fitzpatrick Stainless Comminuter.
20—Powder Mixers, 100 to 4000#.
2—Durco 2"x1½" Pumps, 5 HP.

Partial List Only.
Circulars and quotations on request

BRILL EQUIPMENT CO.
2401 Third Avenue, N. Y. 51, N. Y.
Phone—Cypress 2-5703 *Cable*—BRISTEN

FOR SALE

1—Glass Lined Reactors, jktd. Agit; 5 gal.
1—B.P. 15 gal. H.D. double arm jktd. mixer, vacuum
1—W&P 100 gal. H.D. double arm jktd. mixer
2—Horiz. Retorts 33"W x 28"H x 15'6"L
1—Copper Vac. Pan, 6' dia. jktd, coils, condenser
2—Copper Vac. Stills, 100 gal. jktd, agit.
1—Aluminum Still, 175 gal. coils
1—Aluminum Autoclave, 100 gal. jktd, agit.
1—Iron Autoclave, 130 gal. jktd.
1—Rotary Steam Tube Dryer, 5'6" x 30'
1—J. H. Day #11½D Dough Mixer
14—Stainless Kettles—100# jkt.—50 to 500 gal.
15—Stainless Clad Kettles—40# jkt—30 to 80 gal.
1—Aluminum jktd kettle—40 gal.
1—Aluminum Kettle, 1000 gal., jktd. agit.
6—Copper jktd. Kettles—30 to 120 gal.
33—Glass Lined Tanks 7500 and 8250 gal.
12—Jktd Glass Lined Tanks, 1000, 1450, 1800 gal.
20—Wood Tanks, 3600 to 13,000 gal.
45—Stainless Steel Tanks, 30 to 500 gal.
10—Triclover Stainless Sanitary Pumps,—NEW
6—Durion Pumps, 90 GPM @ 45'
1—Stainless 4-piston filler
6—Ayars 8 pocket model "C" Pea & Bean Fillers
1—Packaging line for cartons—includes former, filler, gluers, etc.
3—Semi-Auto Vac. Fillers, 8 spout, bronze
1—Oslund Auto. Duplex Rotary Labeler
3—World Auto. Rotary Labelers
1—World Semi Auto. Vac. type Labeler
8—World & Ermold Semi Auto-Labelers
4—Wrap around Labelers, for bots & cans
1—Standard Knapp Case Gluer T & B
4—Carton bottom Stitchers, elec. op.
1—Mikro Pulverizer #1SH
3—Resina Auto. Cappers
2—Stainless Colloid Mills, 6".

We Buy Surplus Equipment & Plants

PERRY EQUIPMENT CORP.
1511 W. THOMPSON ST. • PHILA 21, PA.
Phone ST evanson 4-1518 CABLE: "PERI"

ADVERTISERS IN THIS ISSUE

Air Exp. Div. Rwy. Agency Ex..... 149
Allegheny Ludlum Steel Corp..... 62
Allis-Chalmers Mfg. Co.....5, 31, 130
Aluminum Cooking Utensil Co..... 25
Aluminum Co. of America..... 51
American Can Co. 165
American Gas Assoc. 167
American Pipe & Const. Co..... 61
Alvey-Ferguson Co. 180
Anchor Hocking Glass Corp.....212-213
Anderson-Barngrover Div. of Food Machinery 20
Arabol Mfg. Co. 140
Armstrong Cork Company.....123, 135
Aseptic-Thermo Indicator Co..... 176

Bareco Oil Co. 211
Bausch & Lomb Optical Co..... 225
Bemis Bro., Bag Co. 141
Betner Co., Benjamin C..... 30
Bristol Company 24
Brown Boggs, Fdry & Mach. Co..... 137
Buffalo Wireworks Co., Inc..... 203
Brown Instrument Co. 44
Buflovak Equip. Div. Blaw-Knox..... 47

Cambridge Wire Cloth Co. 150
Can Manufacturers Institute Inc..... 53
Carpenter Steel Co. 4
Century Elec. Co. 27
Chain Belt Co. 38
Cherry-Burrell Corp. 9
Chiksan Company 210
Chisholm-Moore Hoist Corp..... 215
Chisholm-Ryder Co. 156
Clark Equipment Company, Industrial Truck Div. 199
Cleaver Brooks Co. 19
Cochrane Corp. 182
Consolidated Siphon Supply Co..... 180
Converted Rice, Inc. 50
Corning Glass Works..... 64
Crane Co. 129
Creamery Package Mfg. Co..... 211
Crescent Metal Products Inc..... 188
Cyclone Fence Co. 206

Darnell Corp. Ltd..... 187
Davis' Sons Mill Machy Co., H. C.... 214
Day Co. 161
Diamond Crystal Salt Co. 195
Dings Magnetic Separator Co..... 217
Drake Hotel 146

Edlaw Co. 219
Eastern Industries Inc. 159
Eaton Mfg. Co.....Insert between 34-35
Economic Machinery Co.....2nd Cover
Electric Storage Battery Co.....28-29
Empire Can Corp. 137
Eriez Mfg. Co. 63

Farquhar Co., A. B..... 217
Filler Machine Co. Inc..... 191
Firmenich & Co. 157
Food Machinery Corp. 20
Frick Co. 152
Fritzsche Bros. Inc..... 207

Gardner-Denver Co. 54
Gaylord Container Corp.....third cover
General American Transportation Corp. 23-158
General Biochemicals, Inc. 218
General Controls 214
General Electric Co.....14-15
General Mills, Inc. 40
GMC Truck & Coach Div..... 16
Gottsho, Inc., Adolph 204
Grinnell Co., Inc..... 59

Hinde & Dauch 178
Huron Milling Co. 195

Inland Steel Container Co. 209
International Minerals & Chemical Corporation 133
Island Equipment Corp. 192

Jackson & Church Co. 200
Jamison Cold Storage Door Co..... 57
Jeffrey Mfg. Co. 18
Jenkins Bros. 42

Kalamazoo Vegetable Parch Co..... 58
Keasbey & Mattison Co..... 8
Kennedy Valve Mfg. Co..... 151
Kiwi Coders Corp. 218
Klensade Products, Inc..... 160
Koven & Bros., Inc., L. O..... 6
Krim-Ko Co. 208

LaPorte Mat. & Mfg. Co. 200
Lee Metal Products Co., Inc. 202
Lewis Engineering Co. Stephen I..... 168
Link Belt Co. 7
Lubriplate Div. Fiske Bros. Refg. Co. 177
Lukens Steel Co. & Division.....52, 142
Lukenweld Div. Lukens Steel Co..... 142
Lunkenheimer Co. 189

Magnus, Mabee & Reynard, Inc..... 162
Magnuson Products Corp. 219
Marsh Stencil Machine Co..... 218
Master Electric Co. 17
McGraw-Hill Book Co..... 168
Mears Kane Ofeldt, Inc..... 196
McPherson Co. 193
Merck & Co., Inc. 36
Metal Glass Prod...Insert between 210-211
Mobilift Corp. 128
Mojonnier Bros. Co. 49
Monarch Mfg. Works, Inc..... 218
Morehouse Industries 166
Mundet Cork Corp. 55

Nash Engineering Co. 119
National Can Corp. 169
National Starch Products, Inc..... 136
National Tech Laboratories 184
National Truck Leasing System..... 174
Niagara Blower Co. 198
Nicholson Co., W. H..... 196
Norda Essential Oil & Chem. Co.... 43
Nukem Products Corp. 182
Nutritional Research Assoc..... 218

Oakite Products, Inc. 155
Omega Machine Co. 202
Orr & Sembower, Inc. 219

Package Machinery Co. 138
Paterson Parchment Paper Co..... 173
Pfaudler Co. 11
Pfizer & Co., Inc., Chas..... 56
Powers Regulator Co. 201

Quaker City Cold Storage Co..... 221

Reeves Bros. Inc. 26
Reeves Pulley Co. 21
Republic Steel Corp.....12-13
Rhinelander Paper Co. Insertion between 210-211
Riegel Paper Corp. 32
Richard Wilcox Mfg. Co. Insertion between 34-35
Ryerson & Son, Jos. T. 66

Safety Car Heating and Lighting Co., Inc. 197
Sarco Co., Inc. 65
Schutz O'Neill Co. 204
Shepard Niles Crane & Hoist Co..... 164
Snell Inc., Foster D. 193
Solvany Sales Div., Allied Chem. & Dye Corp. 181
Spraying System Co. 208
Sprout Waldron & Co. 153
Steel & Tubes Div. Republic Steel Corp. 10
Stephens-Adamson Mfg. Co..... 48
Sterling Electric Motors..... 45
Stokes Machine Co., F. J..... 39
Stokes & Smith 214
Sturtevant Mill Co. 22
Sutton, Steele & Steele, Inc..... 205
Sylvania Div. American Viscose Corporation 139

Taylor Instrument Co. 226
Tennessee Pdts & Chem Corp..... 34
Texas Company .....back cover
Timken Roller Bearing Co..... 35
Toledo Scale Co. 190
Thomsen & Sons, Inc. L. C..... 177

Union Bag & Paper Corp..... 37
Union Special Machine Co..... 148
United Board & Carton Corp..... 194
U. S. Automatic Box & Machy Co..... 46
U. S. Cold Storage 206
U. S. Gutta Percha Paint Co..... 60
U. S. Steel Corporation 33, 206

VanAmeringen-Haebler Inc. 186
Victor Chemical Works..... 147
Viking Pump Co. 207
Virginia Smelting Co. 154

Walworth Co. 183
Waterous Co. 145
Winthrop-Stearns, Inc. 175
Worthington Pump & Machy. Corp.... 120

Yarnall-Waring Co. 41

INGREDIENTS FOR THE FOOD PROCESSOR 218

PROFESSIONAL SERVICE 216

STORAGE, FROZEN FOODS.....222

DISTRICT MANAGERS

NEW YORK 18.....A. G. Sutherland
330 W. 42nd St. — J. F. Juraschek
Longacre 4-3000

BOSTON 16 .....W. Donald Boyd
1427 Statler Bldg. — Hubbard 2-4911

ATLANTA 3.....Ralph Maultsby
1311 Rhodes-Haverty Bldg. — Walnut 5778

CLEVELAND 15 .....Thomas E. Taylor
1510 Hanna Bldg. — Main 3981

DETROIT 26 — David E. Sawyer
2880 Penobscot Bldg. — Randolph 1793

CHICAGO 11.....Grahame E. Riddell
520 North Michigan Ave. Whitehall 4-7900

PHILADELPHIA 3 .....Edward A. Martin
17th & Sansom Streets Rittenhouse 6-0670

DALLAS .....J. H. Allen
5310 Stonegate Road

SAN FRANCISCO 4.....J. W. Otterson
Ralph Dorland
68 Post Street — Douglas 2-4600

LOS ANGELES 14.....C. W. Dysinger
William Menne
621 S. Hope Street — Michigan 3691

ST. LOUIS 8.....Lucas 4867
Continental Bldg.

PITTSBURGH 22 .....Atlantic 4707
7389 Oliver Bldg.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
- Positions Vacant 220
- Selling Opportunities Offered..... 220
- Positions Wanted 220
- Employment Agencies 220
- Employment Services 220

SPECIAL SERVICES 220

EDUCATIONAL
- Schools 220

BUSINESS OPPORTUNITIES 220
- For Sale 220-223

EQUIPMENT 220

MISCELLANEOUS 220

ADVERTISERS INDEX

Aladdin Proportioning Equipment Co., Inc... 220
Allied Equipment Corp..... 222
Atlas Carbon & Clay Corp..... 222
Brill Equipment Co..... 223
Buckeye Cooperage Co..... 222
Castle & Associates, Inc..... 220
Consolidated Products Co., Inc..... 222
Continental Distilling Corp..... 222
Davidson Baking Company..... 222
Emsco Equipment Co..... 221
Equipment Finders Bureau..... 220
First Machinery Corp..... 221
Gelb Sons, Inc., R..... 223
Horne Machinery Co., Inc..... 222
International Food Brokers..... 220
Kehoe Machinery Corp., Lester..... 221
Lowe Corp. Joe..... 223
Machinery & Equip. Corp. The..... 222
Mahoney Machinery 220
Miami School for Food Processing Specialists. 220
Page, Charles E..... 222
Perry Equipment Corp..... 223
Savage Brothers Co..... 221
Sunshine Packing Corp. of Penna..... 222
Union Standard Equipment Co..... 223

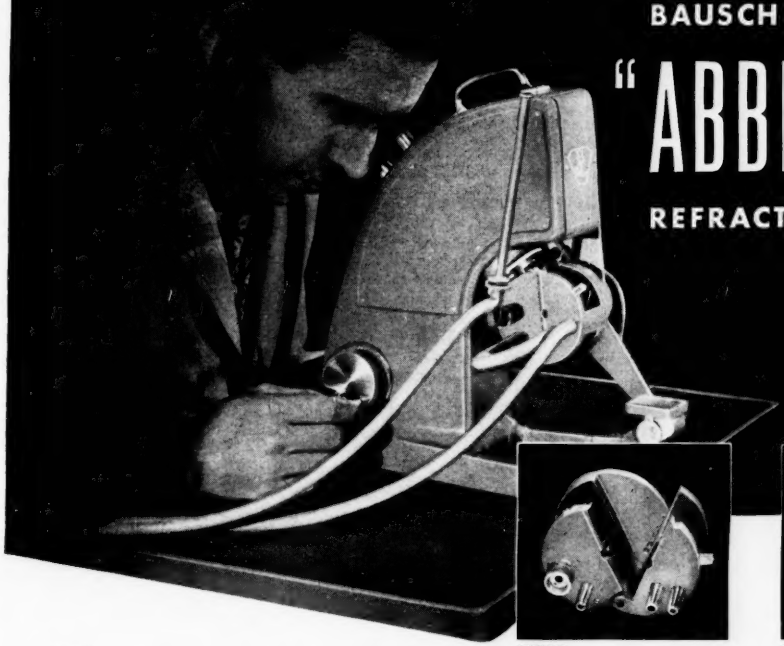
IT'S NEW

IT'S DIFFERENT!

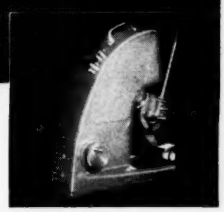
BAUSCH & LOMB

"ABBE-56"

REFRACTOMETER



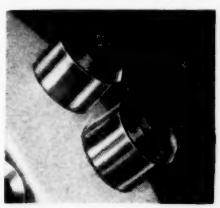
NEW! Extra, easily interchangeable prism set available. No lost time for prism reconditioning.



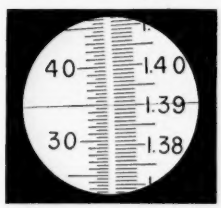
NEW! Streamlined housing protects scale and its moving parts from dust, dirt, damage.

NEW throughout, from base, housing, and eyepieces to thermometer... the new Bausch & Lomb "Abbe-56" Refractometer brings you many new exclusive design features... for easier, lower cost operation... for more accurate readings. In addition to the four important performance advantages shown at the right there are advanced-design features in the telescope system, operating mechanism, prism cement, thermometer, stand, and finish. And, with all these new advancements... *there is no premium price tag.*

WRITE for complete information and a demonstration to Bausch & Lomb Optical Company, 603-C St. Paul Street, Rochester 2, N. Y.



NEW! Inclined, fixed-position eyepieces mounted close together for reading comfort.



NEW! Illuminated, internal glass scales (refractive index *and* sugar percentage).

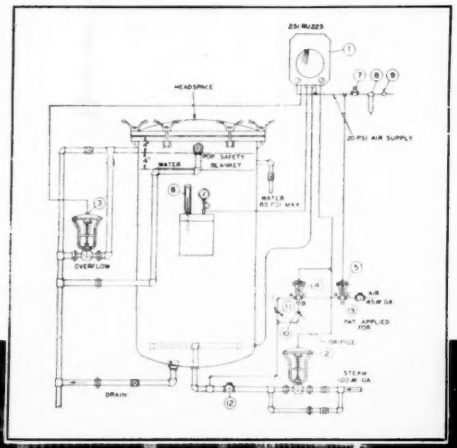
Bausch & Lomb "Abbe-56" Refractometer

HOW TO SAVE MONEY

when you're cooking with glass

COMPETITION is back. Add that to sky-high operating costs and there's but one sound solution to the problem. Beat competition and save money at the same time—by cutting costs to the barest minimum. That's what you'll do with the Taylor W-1 Control System on your vertical or horizontal glass package retorts.

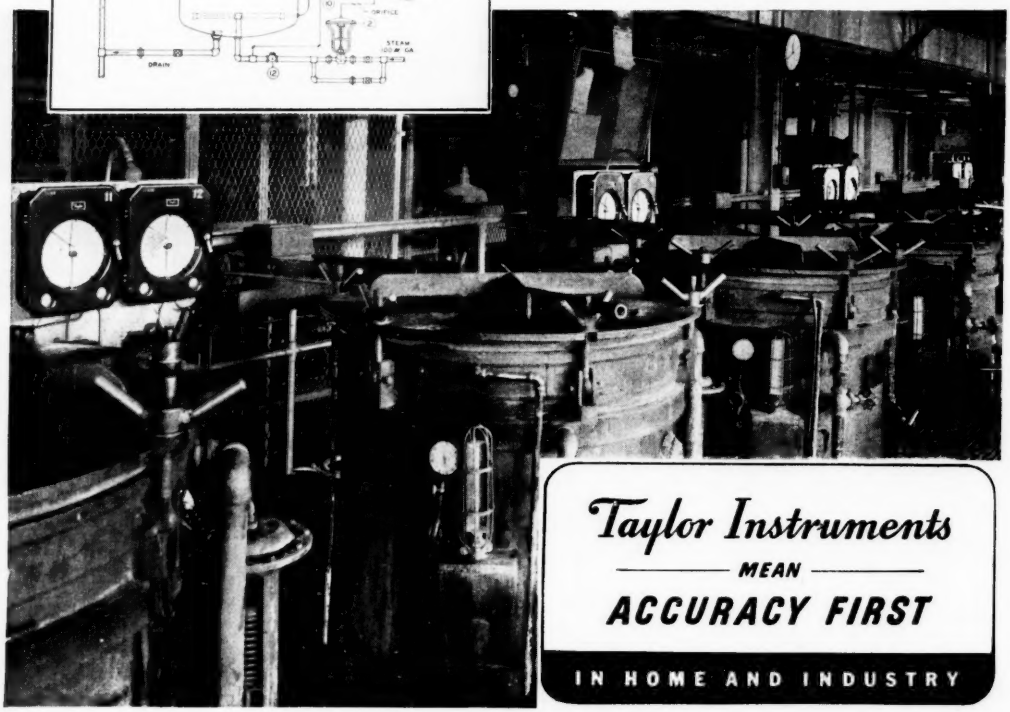
This simple, dependable system automatically controls both temperature and pressure when you're retorting glass packages with standard caps in water.



We provide W-1 with a system of metered quantities of air during "come-up" period, process and cooling. A larger quantity of air is automatically supplied during maximum steam demand of the come-up period providing thorough agitation resulting in uniform heat distribution and penetration. A smaller amount is then automatically supplied to take care of the "process and cooling" portions. Thus, agitation is maintained during cooking and cooling and you are thereby assured of uniform heat penetration and shortest possible processing and cooling times. Quality and production are up, costs down.

With compressed air supplied continuously to your retort for circulation purposes, this metered air system cuts the amount of air used for each cook to a practical minimum.

The Taylor W-1 Retort Control System is just one more example of how we're helping the food industry to keep costs down and quality at the top level. Of course, other more fully automatic Taylor Retort Control Systems are available at slight extra cost. Ask your Taylor Field Engineer! Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow or liquid level.*



Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Gaylord Boxes help you get greater value from your advertising campaign

You invest thousands of dollars in effective, colorful advertisements to build consumer demand and recognition for your product.

To receive the greatest value from your advertising, your product should be delivered to the user in good condition.

And for sales action at the point of purchase, your package must attract favorable attention.

For better protection and greater sales, depend on Gaylord precision built boxes. Artistically designed and colorfully printed, they are a powerful aid to sound merchandising.

Call in a Gaylord sales representative — you'll find his experience a real help.

CORRUGATED AND SOLID FIBRE BOXES

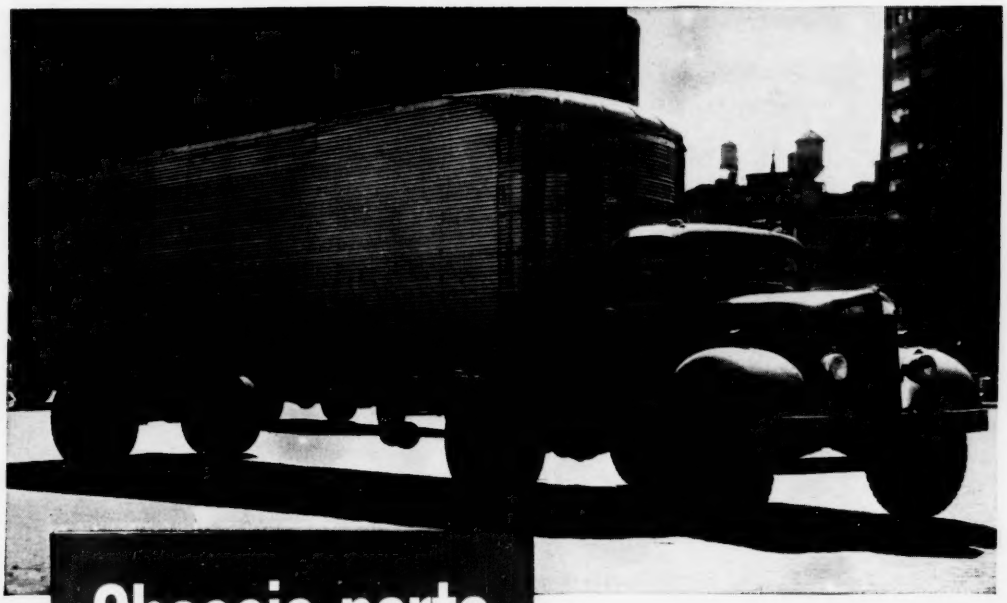
FOLDING CARTONS

KRAFT GROCERY BAGS AND SACKS

KRAFT PAPER AND SPECIALTIES

GAYLORD CONTAINER CORPORATION General Offices: **ST. LOUIS**

New York • Chicago • San Francisco • Atlanta • New Orleans • Jersey City • Seattle
Detroit • Indianapolis • Houston • Los Angeles • Oakland • Minneapolis
Jacksonville • Columbus • Fort Worth • Tampa • Cincinnati • Dallas
Des Moines • Oklahoma City • Greenville • Portland • St. Louis • San Antonio
Memphis • Kansas City • Bogalusa • Milwaukee • Chattanooga • Weslaco
New Haven • Appleton • Hickory • Greensboro • Sumter • Jackson • Miami



Chassis parts last longer

. . . and maintenance costs go down when you use the longer-lasting lubricant—Texaco Marfak

Texaco Marfak is the world-famous chassis lubricant that protects chassis parts for a *thousand miles or more.* It resists squeeze-out, pound-out and wash-out — guards chassis parts against rust and wear, makes them last longer, assures smoother operation, keeps chassis maintenance costs consistently low.

Texaco Marfak Heavy Duty — for use in *wheel bearings* — also provides longer-lasting protection with fewer applications. It seals out dirt and moisture, and seals itself *in* the bearings — assuring safer braking. *Texaco Marfak Heavy Duty* requires no seasonal repacking.

Reduce your fleet operating costs by using Texaco products and Lubrication Engineering Service. Call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 E. 42nd St., New York 17, N. Y.

LONGER LIFE FOR ENGINE PARTS — *Texaco D-303 Motor Oil* is fully detergent and dispersive — *keeps engines clean.* It prolongs the life of all engine parts, assures smoother, more powerful operation, reduces both fuel and maintenance costs. Use it for greater engine efficiency and economy.

MORE THAN 300 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD!

TEXACO

TEXACO Lubricants and Fuels

FOR ALL TRUCKING EQUIPMENT

Tune in . . . TEXACO STAR THEATRE presents MILTON BERLE every Wednesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.